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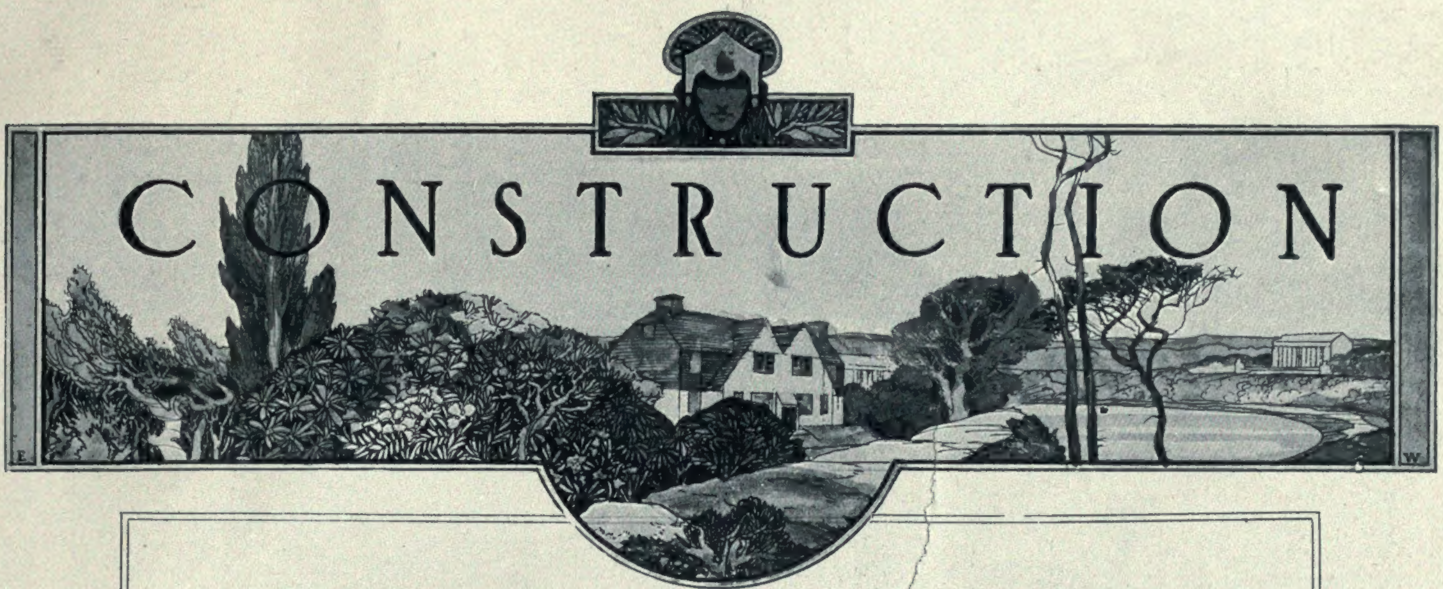

CONSTRUCTION

January, 1917 Vol. 10, No. 1

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KILLENWORTH, GLEN GROVE, LONG ISLAND ....Frontispiece 2

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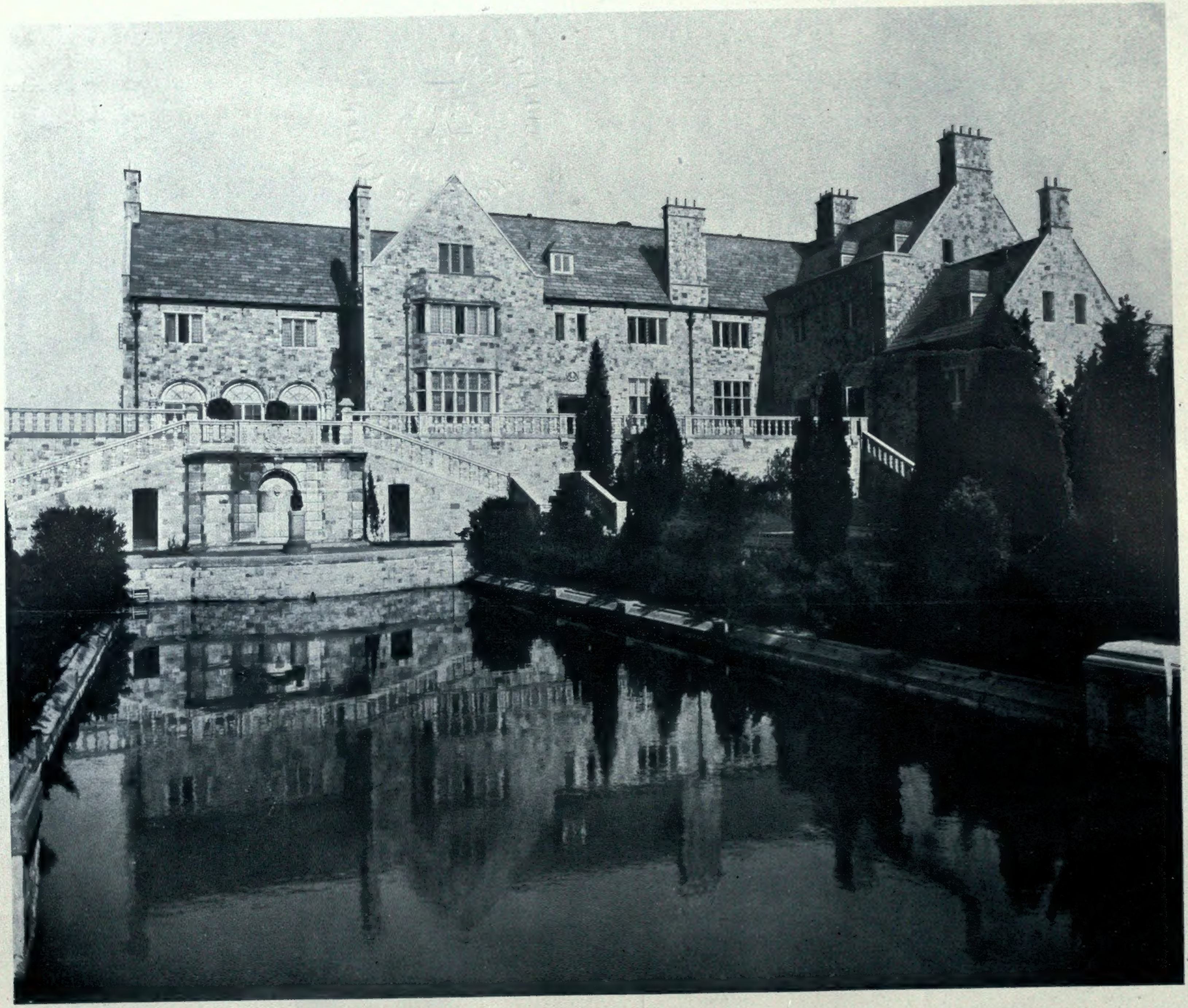
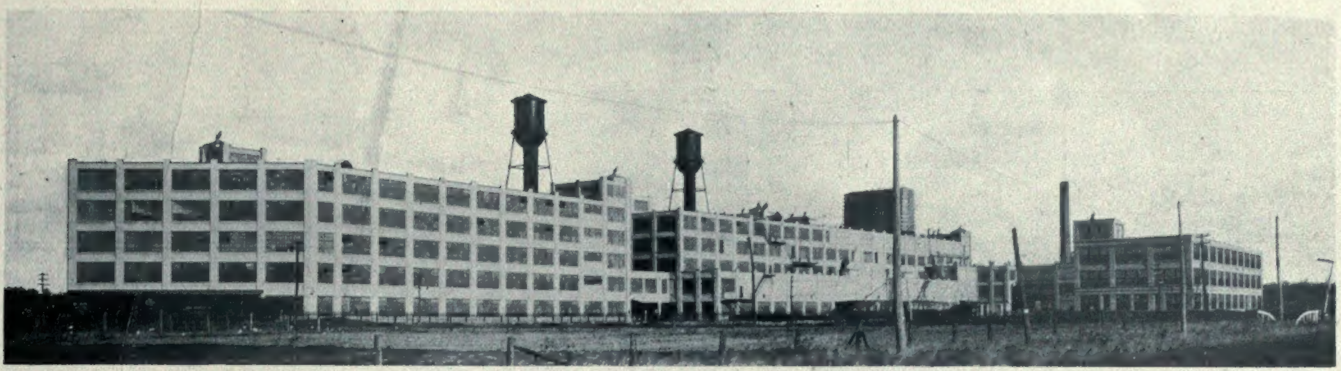


KILLENWORTH, GLEN GROVE, LONG ISLAND.
The house as seen across the pool in the garden of evergreens below the south terrace.



PLANT OF CANADIAN KODAK CO., LTD., KODAK HEIGHTS, TORONTO, ONT.

New Plant of Canadian Kodak Company, Ltd.

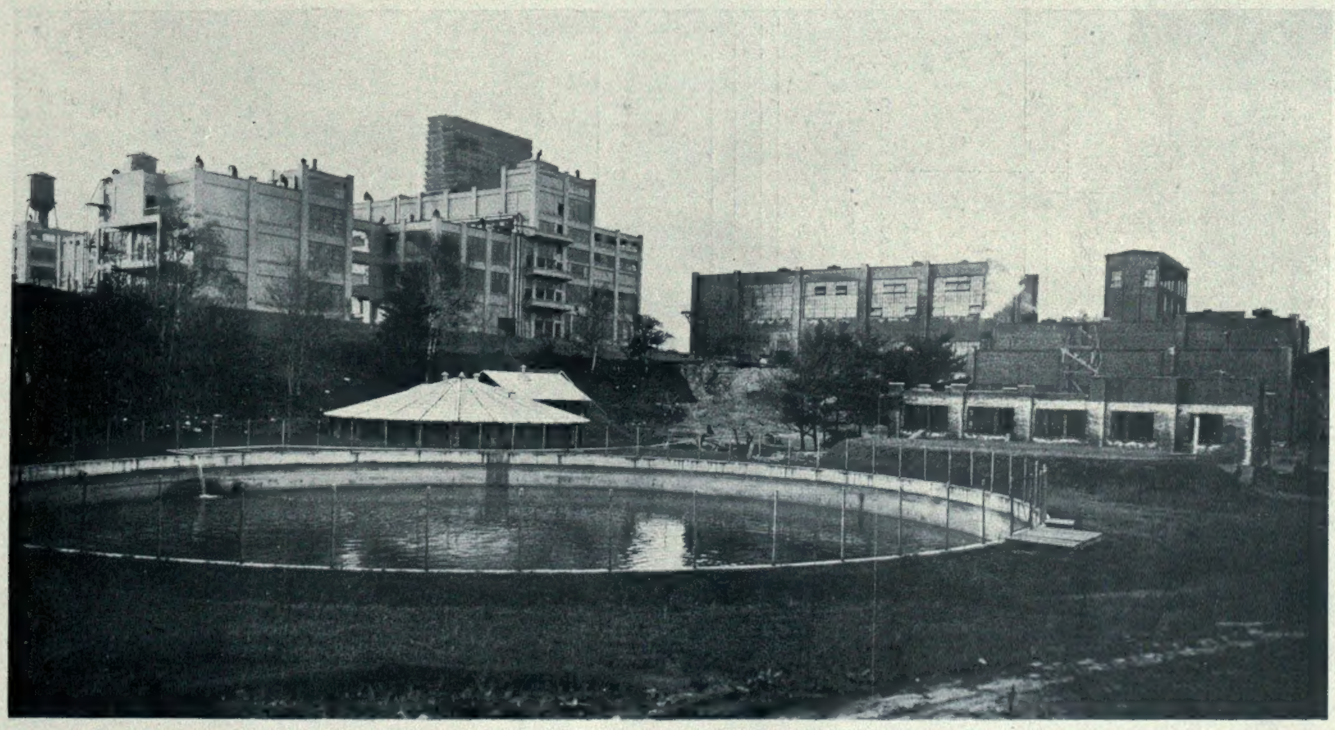
THIS splendid group of factory buildings embodies the most modern ideas in factory construction, and is one of the finest in the Dominion.

In securing a plot of twenty-five acres of ground located on the Canadian Pacific and Grand Trunk Railways, between West Toronto and Weston, and which will henceforth be known as Kodak Heights, the management of the Canadian Kodak Company, Limited, chose a location that is ideal in many ways, situated as it is within easy access of Toronto, splendid transportation facilities, abundance of water for domestic and industrial purposes, and ample grounds both for the present enormous buildings, and future extensions. When the landscape architectural plans now under way are completed, the whole will include one of the most efficient and outstandingly attractive factory groups in Canada.

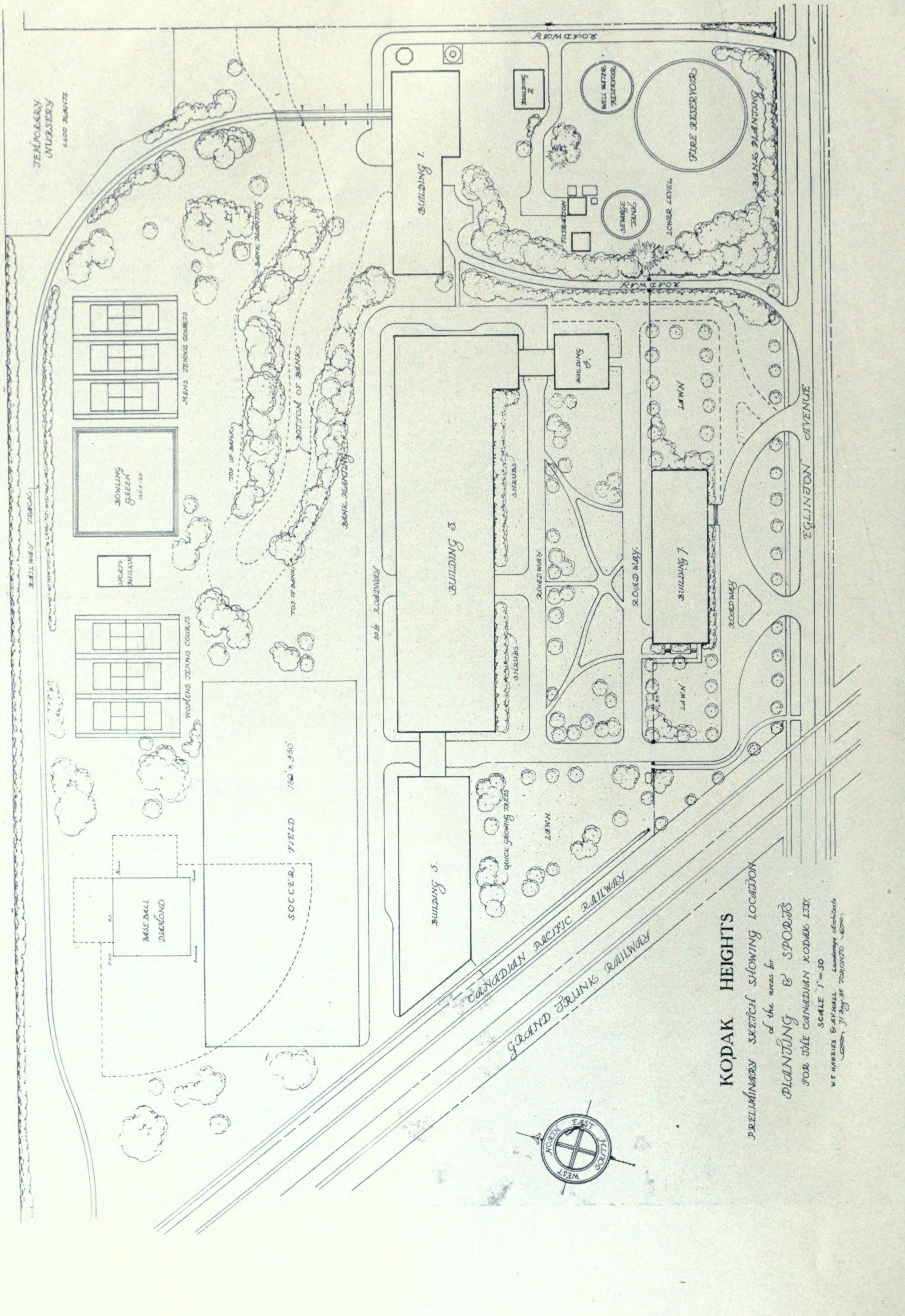
LANDSCAPE ARCHITECTURE.

The problem to be considered in the beautification of the grounds of the modern industrial plant are threefold: First, treatment of the areas allotted by the requirements of the industry to permanent roadways, lawns, parking, etc.; second, the temporary development of the areas set aside for the more immediate future extension of the plant; and third, the beautification of the areas, such as banks and ravines, the provision for recreation housing, etc., on whatever ground seems unlikely to be used for factory buildings for some time to come.

In the treatment of the permanent areas, the object is not only to make the grounds themselves attractive, but to soften the long and severe lines of the buildings, and to lessen the appearance of height. The use of vines on the buildings, the judicious grouping of trees on the lawns, and the establishment of shrubbery along the foundations, do a great deal to accomplish this purpose. The permanent trees, such as the elm, maple, sycamore, etc., are the types for these permanent tree plantations, while the



GENERAL VIEW FROM SOUTH-EAST, OCTOBER 30TH, 1916, PLANT OF CANADIAN KODAK CO., LTD.



KODAK HEIGHTS

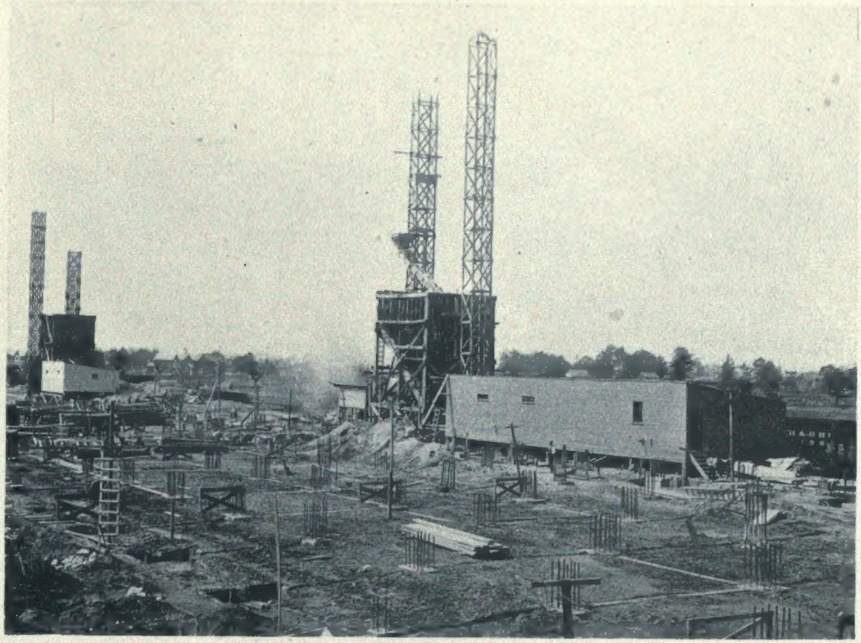
PRELIMINARY SKETCH SHOWING LOCATION
of the areas for
PLANTING & SPORTS
FOR THE CANADIAN KODAK LTD.
SCALE 1" = 50
W. E. HARRIES & A. V. HALL Landscape Architects
TORONTO

shrubs are selected so that their future growth will in no way affect the entrance of light and air to the buildings, and will incidentally add the color of their flower and foliage to the lawns.

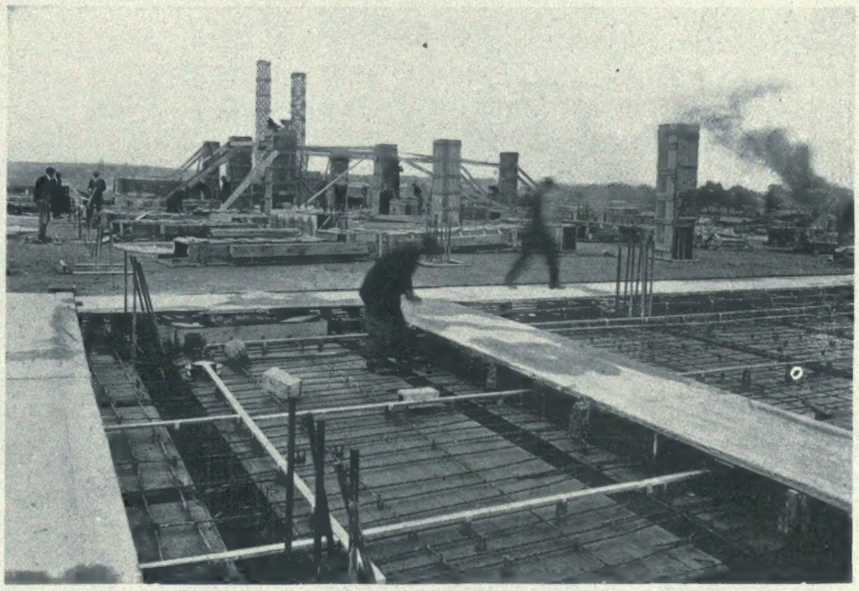
The areas set aside for the first probable extension usually suggest merely a lawn treatment, but in order to overcome the marked difference resulting by leaving these areas in lawn only, and those of the adjoining permanent areas, which have been developed, the short-lived trees have been grouped on these lawns. Their growth is very rapid, and they can either be easily moved or cut down, depending upon their size at the time that the extension actually takes place. This type of tree includes the poplars, lindens, mountain ash, catalpa, etc. Shrub plantations can be established at walk intersections, and in beds along the boundaries of these temporary lawns. These also can be moved whenever it is necessary.

In the case of the Canadian Kodak Company, the treatment of the remaining areas required caring for several steep road slopes; the banks of ravine, which could only be partially filled at present; a high boundary fence surrounding the property; and a coal switch along the north side.

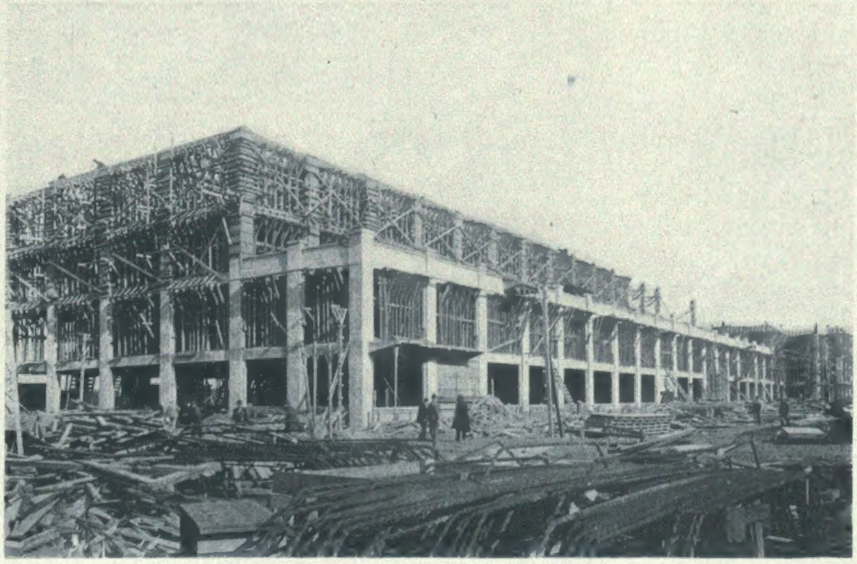
In the general scheme of the future development of the factory, this area of ten acres may not be used for buildings for several years to come. In accordance with the idea of the company, that their employees be given opportunity for exercise and recreation on the grounds, this area was planned to accommodate a baseball diamond, a football field, a bowling green, and tennis courts for both men and women. The boundary fence has been made less conspicuous by a plantation of the Lombardy poplar, which will also serve as a windbreak. The coal switch is screened by a shrub plantation. Shrubs and trees which have especially vigorous root systems, and thrive in light soil, such as the sumach, locust, willows, and acacia, are selected for the plan-



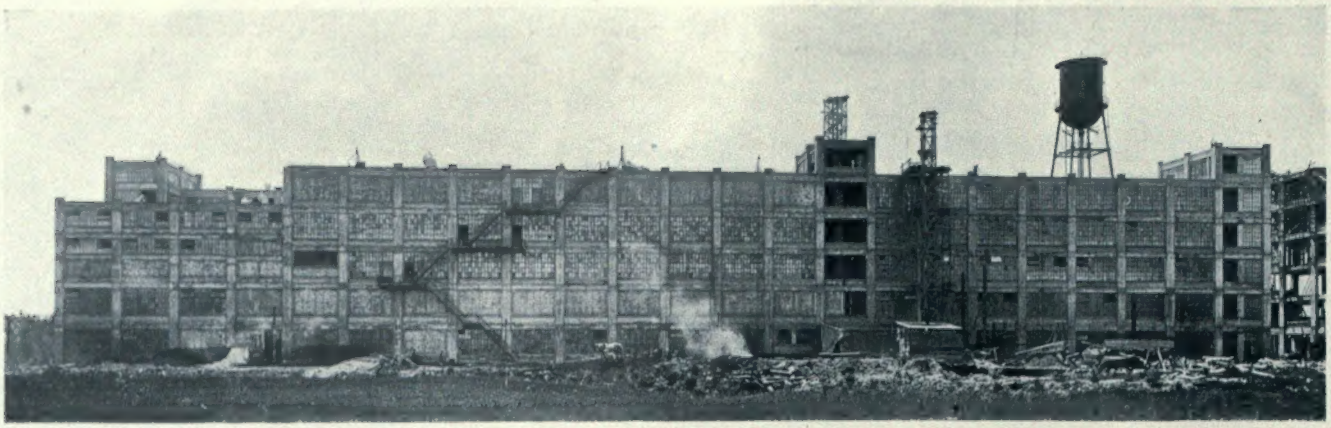
VIEW FROM WATER TANK, OCTOBER 17TH, 1914.



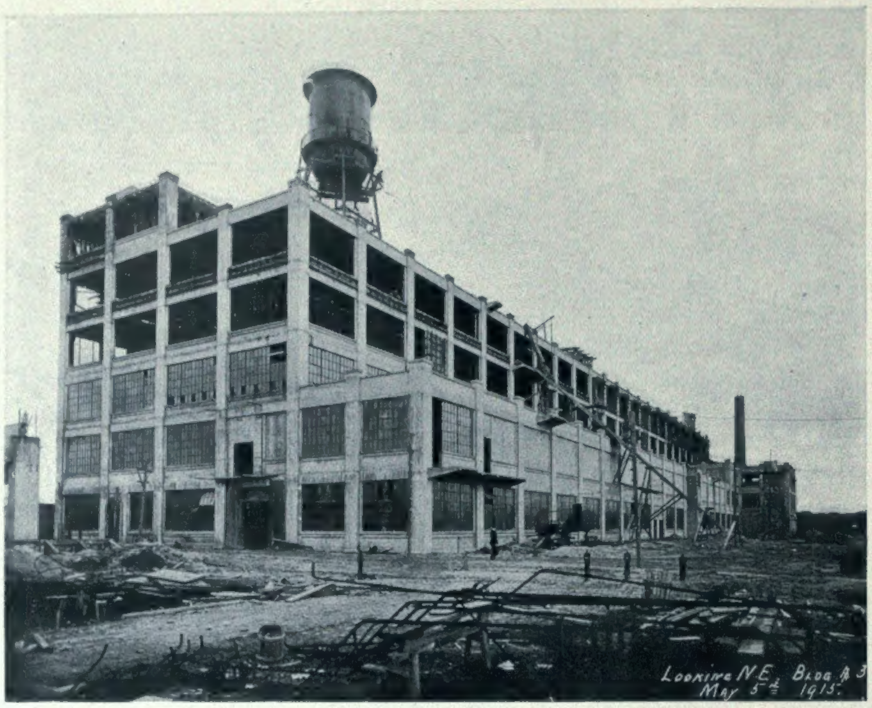
THIRD FLOOR, WEST END, BUILDING NO. 3, OCTOBER 13TH, 1914.



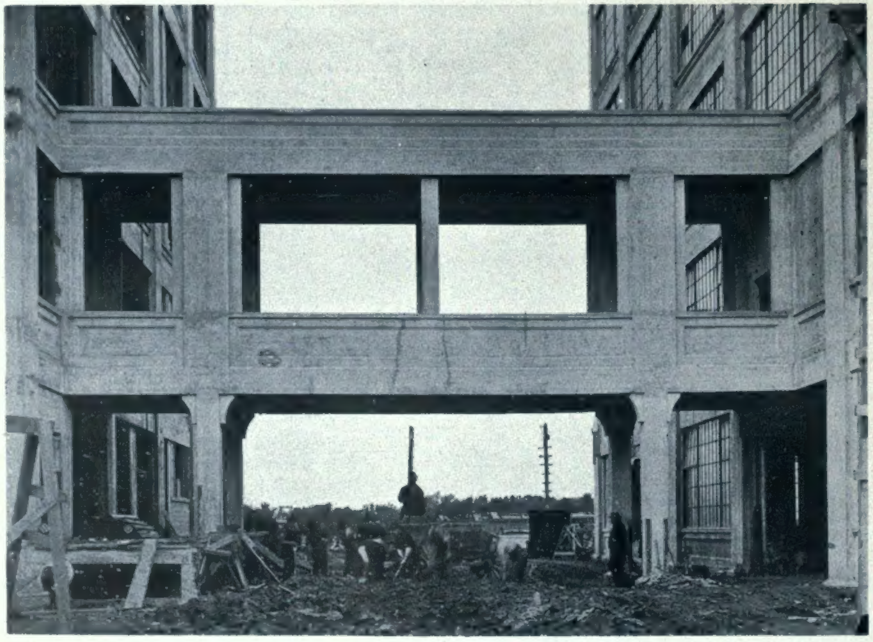
LOOKING NORTH-EAST, BUILDING NO. 3, NOVEMBER 4TH, 1914.



NORTH ELEVATION, BUILDING NO. 3, AUGUST 9TH, 1915, PLANT CANADIAN KODAK CO., LTD.



LOOKING NORTH-EAST, BUILDING NO. 3, MAY 5TH, 1915.



BRIDGE CONNECTING BUILDINGS, NOS. 3 AND 5, OCTOBER 15TH, 1915.

tations on the roadway slopes, and the banks of the ravines. This will very effectively hold these banks in place and will add greatly to the appearance of the grounds as seen from the factory. It is a well established fact that the foliage of the trees and shrubs does a great deal to filter the dust and smoke from the air, and this fact has been kept in mind in planning the tree and shrub groups.

A plan for the finish of the grounds was carefully considered by the company at the beginning of construction in 1914. A complete planting plan was made as soon as the engineers had arranged the buildings to meet their requirements. Provision was made for saving all top soil suitable for finished grading, and the trees and shrubs required were ordered in small sizes to be lined out in a temporary nursery prepared for them. The nursery has made a saving of about fifty per cent. in cost of the shrubs, and there are in the present plantations many varieties which are much larger in size than any that can be secured from the average nursery list.

BUILDINGS AND CONSTRUCTION.

All the buildings, with the exception of the power house, which is a steel frame with brick walls, are constructed of reinforced concrete. The concrete work on these buildings is of a superior nature.

Before commencing construction, bearing tests were made of the soil, and a safe bearing pres-

LOOKING NORTH-EAST, BUILDING NO. E, OCTOBER 15TH, 1915.

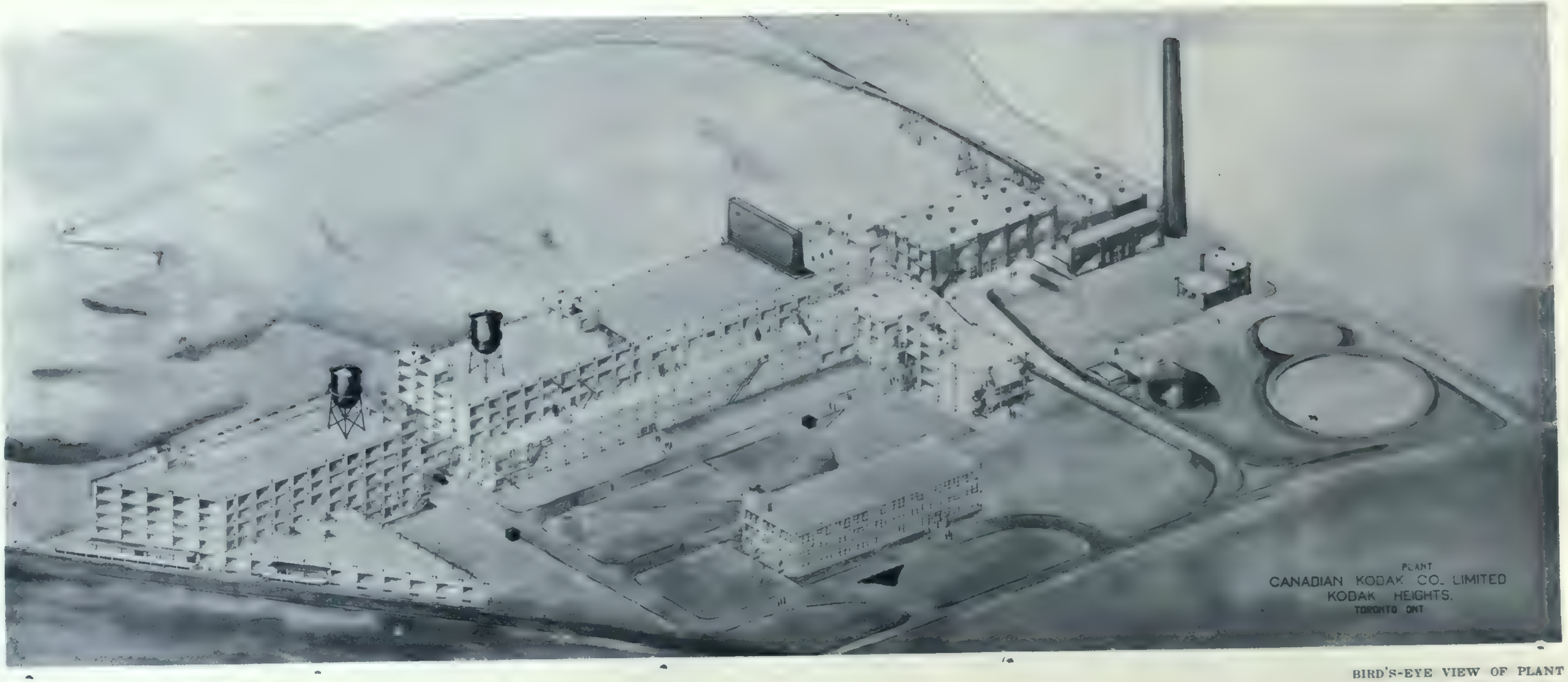
sure of one and one-half tons per square foot established. Concrete spread footings were used for the factory buildings, except the power house, the foundations of which were placed on concrete piles of the mushroom type. Beam girder construction was used throughout. All the interior partitions are of hollow tile, the fire walls being of brick.

Square twisted reinforcing steel was used in all walls and floor systems, and round bars with spiral hooking supplied the reinforcing for the columns. The typical base bearing is twenty by twenty-one feet for live floor loads of one hundred and fifty to two hundred pounds. All concrete was of graded crushed stone and cement, the floors and walls being a one to six mix, and the columns a one to four mix. Beam stresses were taken at six hundred and fifty pounds per square inch compression for the concrete, and sixteen hundred pounds per square inch tension on the steel. Every car of cement was tested at the mills by an independent testing company, and each car of reinforcing steel inspected and tested by another company, which tests conformed for the most part to the standard of the American Society for Testing Materials. Test cylinders were taken of the concrete at the mixer at regular intervals. Test cylinders were required to develop a crushing strength of two thousand pounds per square inch in twenty-eight days. These tests were made in the testing department of the University of Toronto.

All the concrete was required to be machine mixed, and no spouting over twenty feet allowed. As some of the work was carried on in cold weather, special precautions were taken so that when the temperature fell below twenty-three degrees Fahrenheit, artificial heat was required. The casement sills were placed as a monolith with the ground floor slab. The slabs of the upper floors were wire brushed while the concrete was green. This was found later to be a waste of labor, as all slabs had to be picked for cement or mastic finish. Railroad tracks were run parallel with the various buildings. Bottom dump cars were used for the stone and bottom dump waggons for the sand. All this material was dropped into a hopper, picked up by a bricked hoist, and deposited in an over-head hopper capable of holding four car loads. The material was drawn into measuring hoppers by gravity, and then discharged into a mixer. The mixed concrete was hoisted in half-yard batches and discharged into six feet concrete buggies.

In addition to fire escapes, all buildings have stairways of the stair tower type; in other words, to reach a stairway one has to pass across an open balcony and into a stairway separated by heavy fire walls from the remainder of

MAIN ROOF, BUILDING NO. 3, JULY 20TH, 1915, PLANT OF CANADIAN KODAK CO., LTD.



C. K. FLINT, CONSULTING ENGINEER.

BIRD'S-EYE VIEW OF PLANT OF CANADIAN KODAK CO., LTD., KODAK HEIGHTS, TORONTO, ONT.

VIEW FROM LOWER ELEVATION AT EASTERN SIDE OF PLANT DURING CONSTRUCTION.

MAIN ROOF, BUILDING NO. 3, AUGUST 9TH, 1915, PLANT CANADIAN KODAK CO., LTD.

the building. It is found that this open balcony is not satisfactory for this climate, and they were finally closed in with a sash with clear glass, and especially large ventilators, which give a large opening by touching a lever, allow the smoke to escape.

Window cleaning bolts were placed in all cornices over which scaffolds could be suspended for window cleaning purposes.

The roofing consisted of four inches of cinders covered with cement finish and five-ply tar and slag roofing. Three-eighth inch pitch per foot was used, the main pitches being placed in a concrete slab. A copper counter flashing was placed in the forms before concrete was poured, being held in place by wooden strips which remained in the concrete. This was found to be a very satisfactory method.

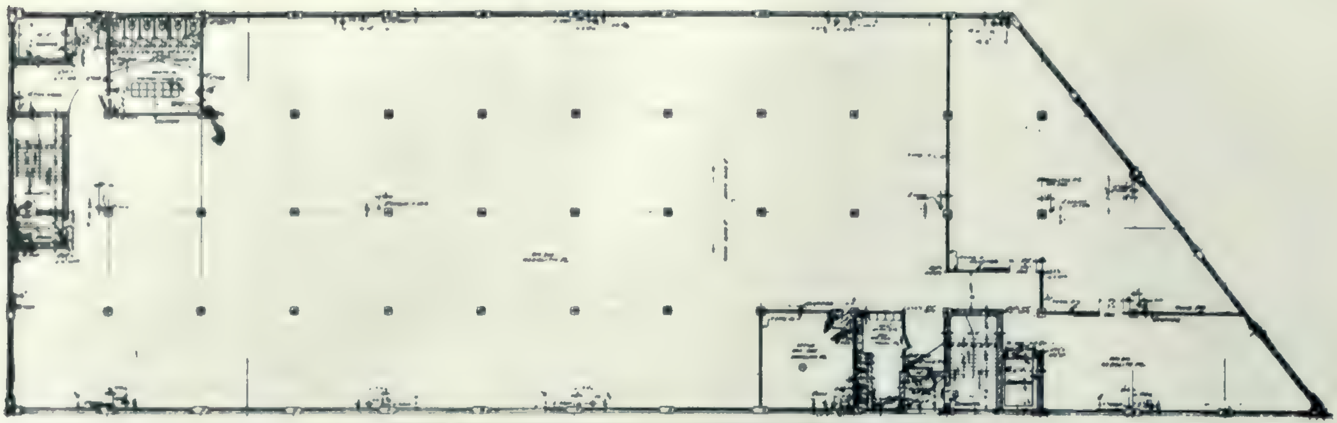
One interesting feature in the concrete construction was the concrete bridges between buildings. Dowel rods were left in the buildings, and the bridges poured at a later date. Subsequent shrinkage in temperature changes caused the bridges to contract in opposite direction to the buildings. This resulted in the tearing of the concrete from the dowel rods and quarter-inch cracks opening up at bridges and building connections. Cracks already occurred in the bridge and the building near the bridges.

During the process of construction, quite a large fire occurred which, in addition to burning out form lumber under green concrete, allowing same to drop, burnt out the form work in one roof section which was two weeks old, and then in the process of being stripped. This concrete was quite badly damaged, but remained standing. Holes one foot square occurred in the slabs and a considerable amount of slab column steel was exposed. This was cleared and plastered with cement mortar, and subsequently subjected to an exhaustive test. One-eighth inch deflection was the maximum obtained with twice the specified live loading.

The entire fenestration of the group, comprising seventy-five thousand square feet, is of steel sash.

Over the cement floors, except in the power plant, was laid mastic flooring by experts, especially trained for this work. Owing to the different requirements of the various departments, and the varying degrees of temperature in the separate departments, it was found neces-

MAIN OFFICE BUILDING, PLANT CANAADIAN KODAK CO., LTD., KODAK HEIGHTS, TORONTO, ONT.



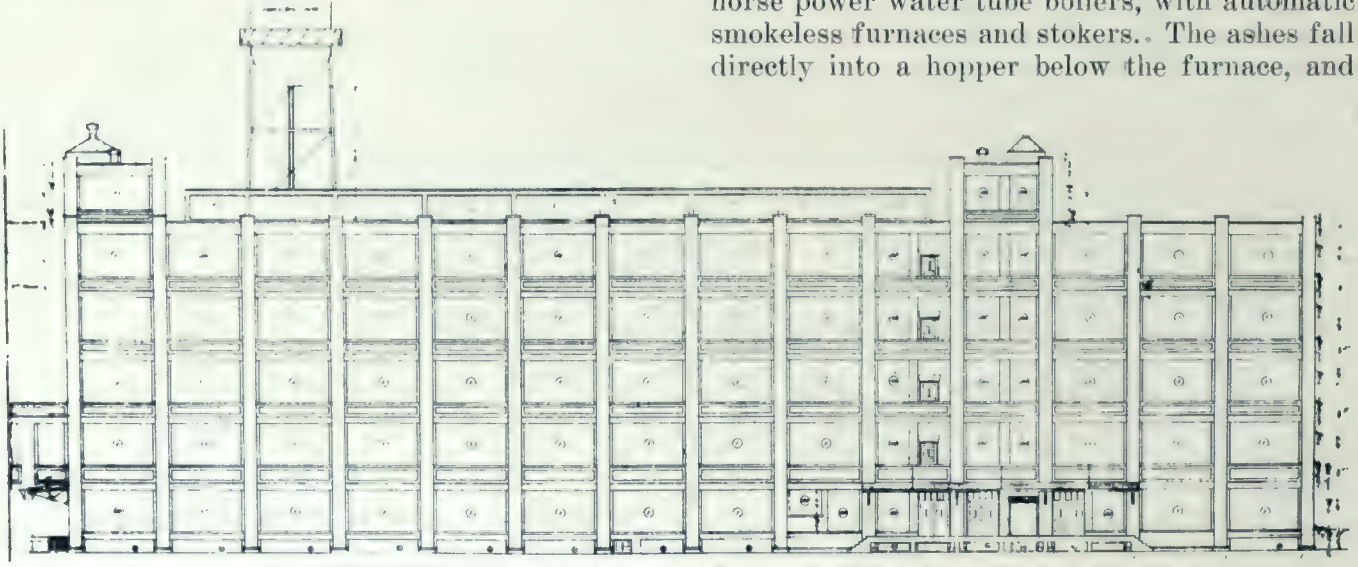
FLOOR PLAN, BUILDING NO. 3, CANADIAN KODAN CO., LTD.

sary to have different mixtures to withstand the different temperatures. This makes a permanent flooring, and requires no upkeep cost.

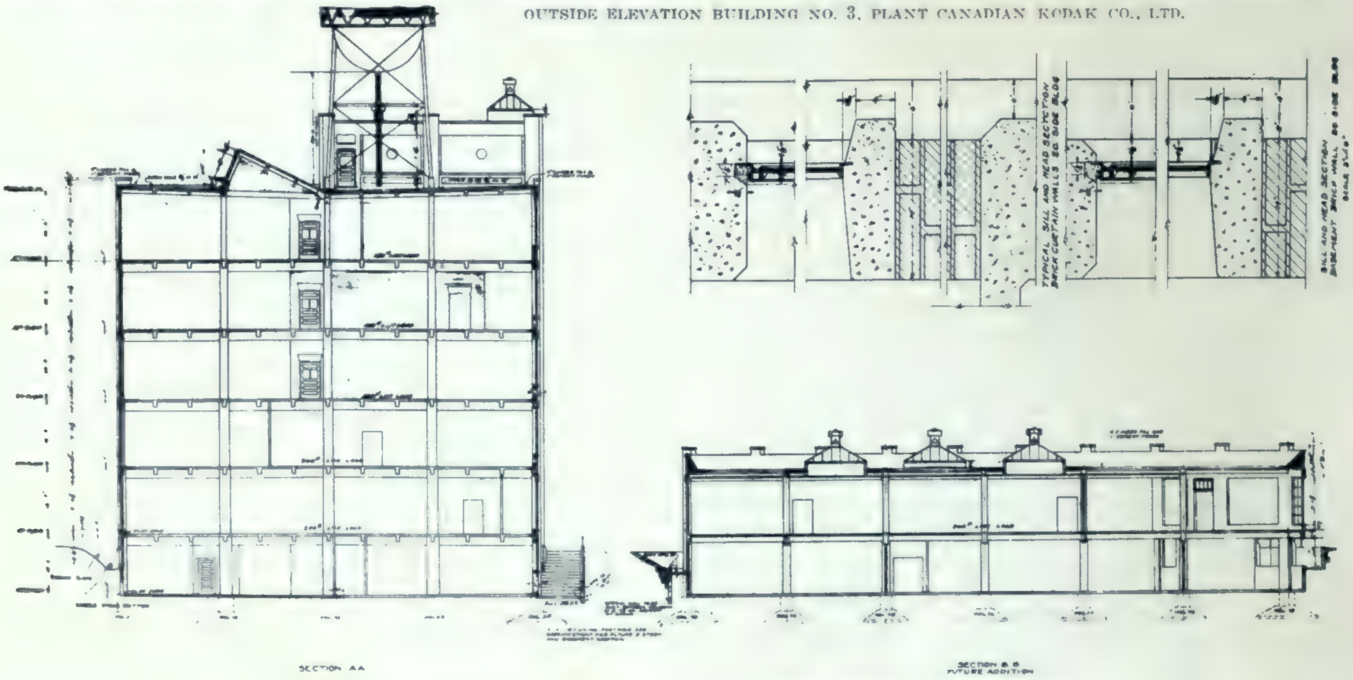
All wood used, being required for water cooler, tanks, fencing, etc., was treated with carbolite carbolineun.

POWER, LIGHTING, HEATING, VENTILATION.

The power plant was laid out for a future of fifty per cent. increase in equipment. The building is two hundred and thirty-five by sixty feet in plan, and located in the valley at the rear of the main building with the boiler room floor thirty-five feet below the general first floor level factory buildings. This allows coal to be brought in railway cars over a steel trestle. The coal is then dumped from the cars into a six hundred ton concrete coal bunker located directly over a battery of four thousand three hundred horse power water tube boilers, with automatic smokeless furnaces and stokers. The ashes fall directly into a hopper below the furnace, and



OUTSIDE ELEVATION BUILDING NO. 3, PLANT CANADIAN KODAK CO., LTD.


TYPICAL SILL AND HEAD SECTION BRICK CURTAIN WALLS SO. SIDE BLDG
SILL AND HEAD SECTION BASEMENT BRICK WALL SO. SIDE BLDG
SECTION AA
SECTION B-B FUTURE ADDITION

TYPICAL SECTION ELEVATION OF NO. 5 BUILDING, PLANT CANADIAN KODAK CO., LTD.

are drawn off into small hand cars in the ash tunnel below the furnaces. These hand cars are picked up by a one-ton sprig hoist and deposited in an overhead concrete bin.

Straight pipe fuel economizers are used, and the smoke is taken away by a two hundred foot radial brick chimney.

The boiler water is obtained through an outside reservoir which is fed by three artesian wells and rain water from the roofs. This water is passed through a water softener which has a capacity of six thousand U.S. gallons per hour. An exhaust, fifteen hundred horse power feed water heater and receiver is used. This makes use of exhaust steam from the engines at three pounds pressure. The boiler feed water then passes through a water weigher into feed water pumps. One hundred and twenty-five pound boiler pressure is carried for the engines and pumps. This is reduced in the power house for factory purposes. Three pound exhaust steam is delivered to all the buildings for heating purposes. Steam traps were used in connection with the various low pressure steam lines. A system capable of caring for a twenty-four thousand horse power capacity is used in connection with all the high pressure steam piping in the power house. Two vacuum pumps capable of taking care of eighty thousand square feet of radiation on one-quarter pound per square foot are used for the steam returns.

The generator room is capable of developing five hundred kilowatts. D.C. current at two hundred and twenty volt is used. There are three generating units. One new unit of a three hundred K.W. capacity is also being installed.

The engine for this new generator is an Inglis horizontal cross compound heavy duty Corliss, direct connected to a three hundred K.W. direct current generator, and runs at one hundred and fifty revolutions per minute with steam at one hundred and fifty pounds and five pounds back

SEWAGE DISPOSAL, OCTOBER 26TH, 1914, PLANT CANADIAN KODAK CO., LTD.

VIEW OF RESERVOIR, MAY 18TH, 1915, PLANT CANADIAN KODAK CO., LTD.

RESERVOIR, JULY 26TH, 1915, PLANT CANADIAN KODAK CO., LTD.

COAL TRESTLE, OCTOBER 13TH, 1914, PLANT CANADIAN KODAK CO., LTD.

pressure. The valve gear is operated by double wrist plates set for long range cut off. The governor controls both high and low pressure cylinders. The cylinders are double ported, and valves are fitted with releasing gear, hooks of which latch outward. The fly-wheel is eleven feet in diameter, and weighs twenty-two thousand pounds. Eccentrics, cranks, etc., are enclosed in planished steel oil guards. Cast iron drip pans also form sole plates for the cylinder stools. The whole unit is mounted on a foundation built as a large concrete slab supported on concrete piers to allow easy access to piping, wiring, etc., which are below the engine room floor. Counterbalanced cranks are used to eliminate vibration.

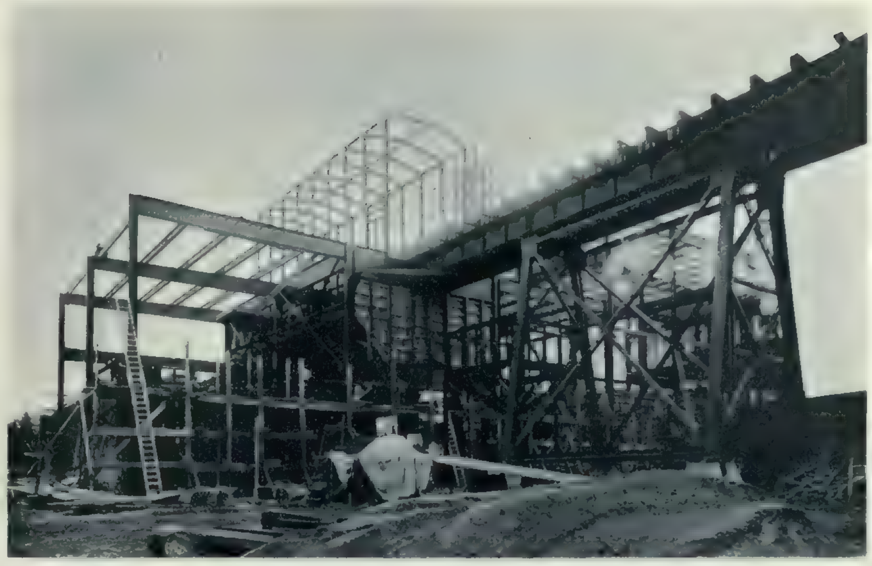
REFRIGERATION.

The main unit of the three hundred and ninety ton refrigeration plant is the York two hundred ton machine, the largest vertical ammonia compressor in Canada.

This machine has two vertical, single acting compressors, each twenty-one inches bore by thirty-two inches stroke. They are of the stand construction, equipped with safety heads. The discharge end of the compressor is water jacketed, and the suction end insulated with nonpareil cork. Each compressor is equipped with indicator connections, and pressure relief valves in heads; the stuffing box nuts are operated by hands wheels geared from same, so that they can

PILE DRIVER, BUILDING NO. 1, JULY 27TH, 1914.

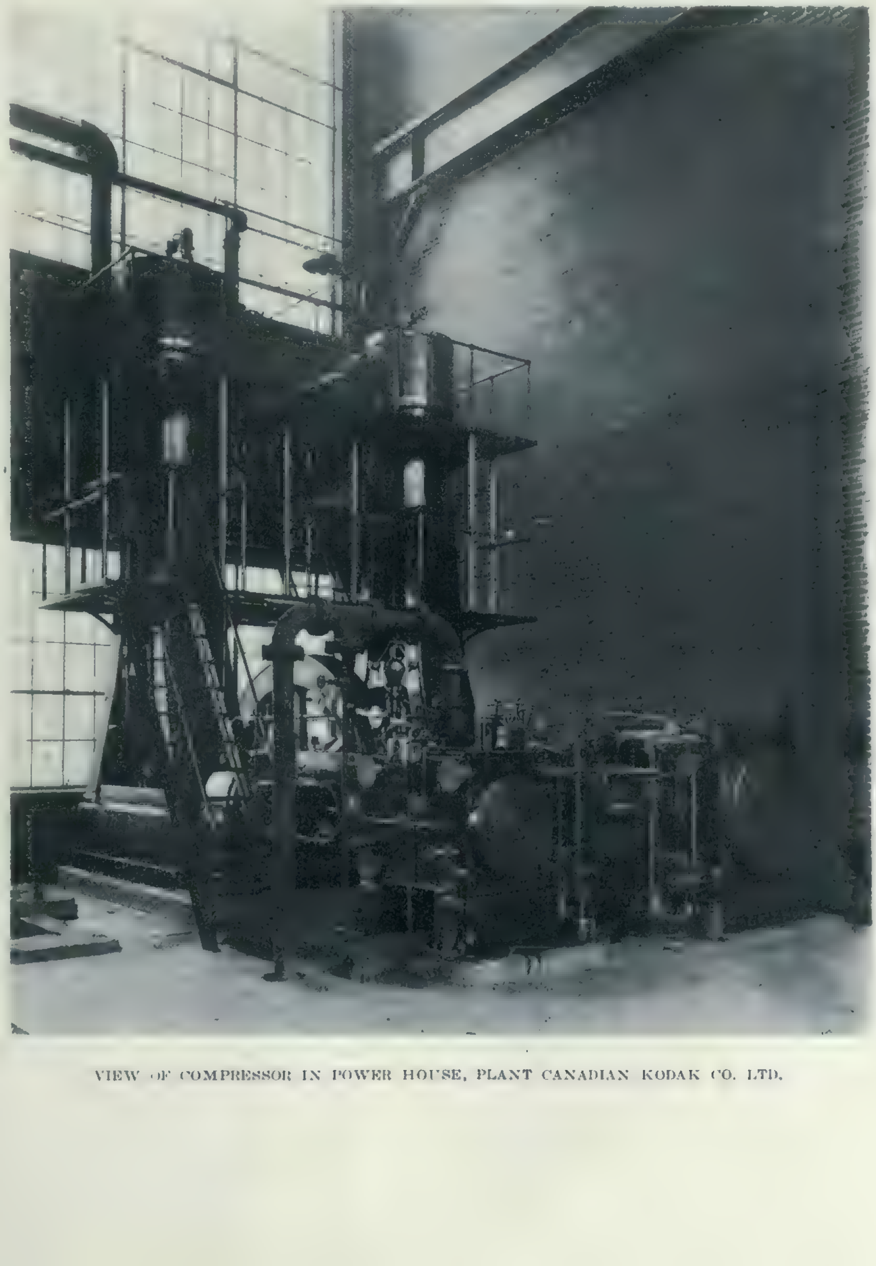
WATER SOFTENER, JUNE 21ST, 1915.



LOOKING SOUTH-WEST, BUILDING NO 1, MAY 5TH, 1915, PLANT CANADIAN KODAK CO., LTD.

be adjusted by the engineer standing on the floor without going up to the first gallery of the machine. The compressors are direct connected to a horizontal cross compound Corliss engine. The high pressure cylinder is twenty inches by thirty-two inches, and the low pressure, thirty-two inches by thirty-two inches. Each steam cylinder is equipped with force feed lubricator, hand oil pump, indicator connections, and two relief valves. The piston rods are of nickel steel. The pistons have metal wearing rings in addition to the packing rings, and the machine is packed throughout with metallic packing. The machine is fully equipped with every accessory, even to nickel-plated revolution counter, with ten-inch dial and central oiling system. The compressors have a capacity of two hundred tons ice melting in twenty-four hours when operating at one hundred and eighty-five pounds condensing pressure, twenty pound suction pressure, and sixty-five r.p.m.

The compression side consists of eight of the latest type double pipe, flooded ammonia condensers, made of two-inch and three-inch pipe eighteen feet long. These condensers are equipped with a purge drum for collecting the foreign gases,



VIEW OF COMPRESSOR IN POWER HOUSE, PLANT CANADIAN KODAK CO. LTD.

and have wash out connections for the water tubes in addition to the regular water and ammonia valves and connections. The ammonia receiver is three feet six inches in diameter and sixteen feet long, and the high pressure oil separator is two feet in diameter and eight feet long. Both are wrought iron welded shells of standard construction. There is a check valve in the five-inch discharge line between the compressor and the condenser.

The evaporation side of the plant consists of water coolers and brine coolers, located in the room adjacent to the engine room, from which the water and brine is pumped to the different points in the factory where the refrigeration is Water cooling is accomplished by means of twelve stacks of water cooling coils, arranged in two batteries of six stacks each. Each stack is made of two-inch galvanized genuine ammonia pipe, twelve pipes high and twenty feet long, equipped with water distributing trough and galvanized iron splash strips between each pipe. Each battery of water coolers is equipped with oil drains and collecting tank, and the suction gas passes through a trap or accumulator, which separ-

FRONT VIEW OF BOILERS, OCTOBER 4TH, 1915, PLANT CANADIAN KODAK CO., LTD.

ates any liquid ammonia before it passes on and through the main thirty-inch by ten-foot scale trap in the suction ammonia line near the machine. By means of these various traps the gas is bound to reach the ammonia compressors in a slightly super-heated condition, which insures the machine operating at the very highest efficiency, at the same time enabling the cooling coils to be flooded with ammonia, so as to work at their maximum efficiency.

The brine cooling is accomplished by means of two York shell and tube type horizontal brine coolers, one fifty-one inches in diameter by sixteen feet long, the other thirty-nine inches by twelve feet long, with provision for future cooler, located on the floor above the water cooling room.

The brine storage tank has a capacity of thirty thousand gallons, and is located on the floor above the brine coolers. Two five hundred gallon per minute brine circulating pumps are located in the basement three floors below the brine tank, and one floor below the machine room. Eight-inch brine mains connect them to storage tank, brine cooler and cooling system.

The water cooler room, brine cooler, brine tank, brine mains, and all exposed cold ammonia mains are insulated with nonpareil cork. The cold water circulating pumps and brine pumps are of the triplex type, each pump direct connected to its own motor.

The water for ammonia condensing purposes is cooled by means of an atmospheric type water cooling tower on the roof of the main building. The water is circulated over this tower through the condensers by means of two centrifugal pumps direct connected to their own motors, each of a capacity of five hundred gallons per minute.

In addition to the new equipment described, there is a York fourteen by twenty-one inch vertical, single acting compressor, direct connected to a fourteen by twenty-six by twenty-one inch cross compound Corliss engine, and a vertical De La Vergne machine equipped with York eighteen by twenty-eight inch ammonia compressors of one hundred and twenty-five tons capacity. This machine is direct connected to a horizontal simple Corliss engine.

The compression side for these latter two machines consists of eight stacks of standard counter current double pipe ammonia condensers, and five stacks of flooded double pipe ammonia condensers, with all necessary high pressure traps, receivers, etc., which are cross connected to the new unit and are arranged so that any one machine can be used on any or all of the condensers, either together or separately.

The refrigerating plant, as a whole, is one of the largest in Canada, and the new unit as described is the largest single acting ammonia compressor installed in this country to date.

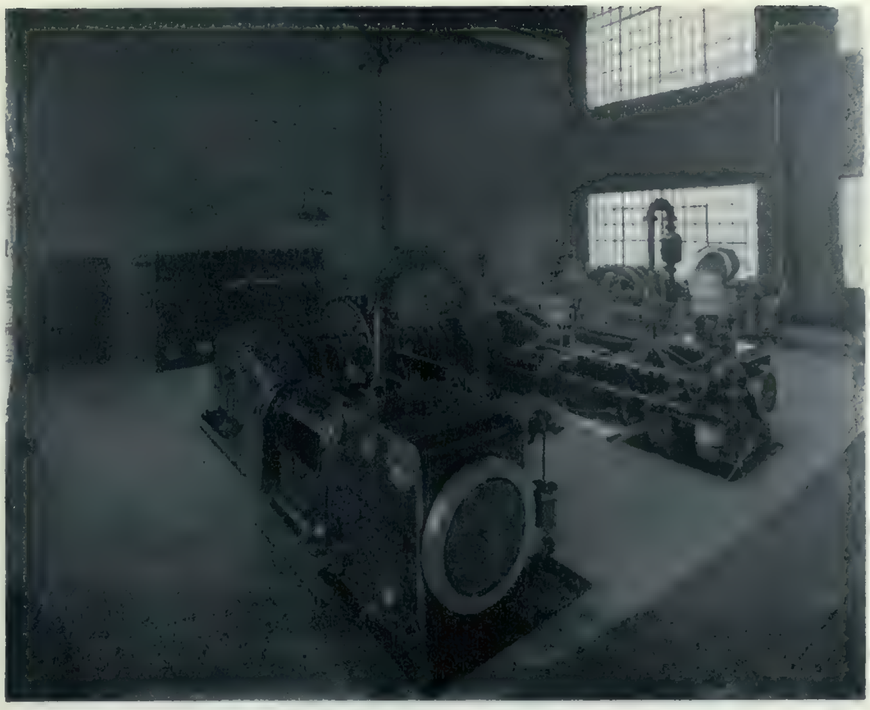
Two fifteen-ton hand-power cranes are used, one in the generator and one in the ice machinery room. All the steam brine and chill water lines are carried through the power house to the various buildings through underground concrete tunnels. One hundred and

BOILERS AND FILTER FOUNDATION, PLANT CANADIAN KODAK CO., LTD.

sixty of these tunnels were required, ranging in size from nine feet by eight feet to four feet six inches, by four feet six inches in sections.

WATER SUPPLY.

Water for drinking and factory purposes is obtained from three artesian wells ranging from one hundred and fifty to two hundred feet in depth. These wells flow into an eighty thousand gallon, well water, closed in, concrete reservoir. The overflow from this reservoir and the rain water from the roofs is collected in a seventy-five thousand gallon open concrete reservoir. This latter reservoir supplies the boilers. A twenty-five thousand sprinkler tank is used for general factory purposes where purity is not required.



VIEW IN POWER HOUSE, PLANT CANADIAN KODAK CO., LTD.

The sewage disposal plant, capable of handling a population of one thousand, is installed on the company's property. This plant consists of a chlorine house, sludge in separator tanks, dissolving chamber, percolating filter and sludge beds in humus tanks.

Recent Tests by Bureau of Standards

Among the tests conducted recently by the United States Bureau of Standards as aids to the development of industrial methods were series relating to the construction of concrete columns and the production of insulating material.

Three tests were made of a special commercial insulating material to determine its fire-resisting properties. The material submitted by the manufacturers was intended for use in a number of instances to replace wood. The test specimens were about eighteen by eighteen inches and six inches thick. They were placed in a furnace as a panel, one of the larger faces being exposed to the heat of the furnace and the other to the atmosphere. Upon being heated to nine hundred and fifty degrees in thirty minutes and held at that temperature for four hours it was found that the temperature at a distance of one and one-half inches from the heat-exposed surface was about two hundred and forty degrees C. At a depth of five and one-half inches from the heat-exposed surface sixty-six degrees was the highest temperature recorded. One of the blocks after having been subjected to this heat for the period mentioned was quenched with water. The damage to the specimen that was quenched was found to be less than to an unquenched specimen. This is explained by the fact that the blocks contained considerable organic matter which tended to be disintegrated by the heat transmitted very slowly from the heated surface, even after the flame was removed from it.

VIEW OF PUMPS IN POWER HOUSE, PLANT CANADIAN KODAK CO., LTD.

The series of tests of concrete columns was partly in the nature of an investigation and partly in the nature of routine testing. These are the first columns of their kind to be tested in this country. The unique feature is a hollow cast-iron core. This is surrounded by concrete, reinforced with both spiral and vertical reinforcing. Such a column may be made very cheaply. Not many results have yet been obtained, but the tests are still in progress. It would appear, however, that the load which these columns can sustain is considerably in excess of that which can be borne by the ordinary reinforced concrete column of an equivalent cross section.

Painting of Cement

Of the many difficult surfaces requiring the application of paint, cement is, perhaps the worst. The trouble is due entirely to the alkaline character of cement. This not only attacks the oil in paint, but draws dampness, another enemy of paint, when it attacks it in the rear or back. Cement that has stood to the weather for a year or so has lost much of its alkali, and then paint does fairly well.

One of the earliest remedies used for preparing cement for painting was a seven to eight per cent. solution of muriatic acid. But where there was much lime present it was found that the acid acted upon the lime, converting it into calcium chloride. This would cause a pitting and crumbling of the surface, practically destroying it. The discovery of the zinc sulphate treatment was most opportune, and is by far the best treatment yet found. A master painter named Nicholls claims to have introduced this treatment, and took out a patent for it. First, the cement surface is cleaned and must be perfectly dry. Then a coat of zinc sulphate solution, equal parts of each by weight. The water and zinc sulphate are intimately mixed and applied by means of a stiff brush. The zinc sulphate changes the caustic lime of the cement into calcium phosphate, or gypsum, and zinc oxide is deposited in the pores of the cement. Zinc sulphate is one of the most important of white paint pigments, and when paint is afterward applied to the coating it becomes incorporated with it, giving a very durable surface. Inasmuch as zinc sulphate has no known harmful effect on cement or concrete surfaces, the fact adds to its value in this connection. Many public and private buildings have been treated with this process, and with perfect success, it is claimed.

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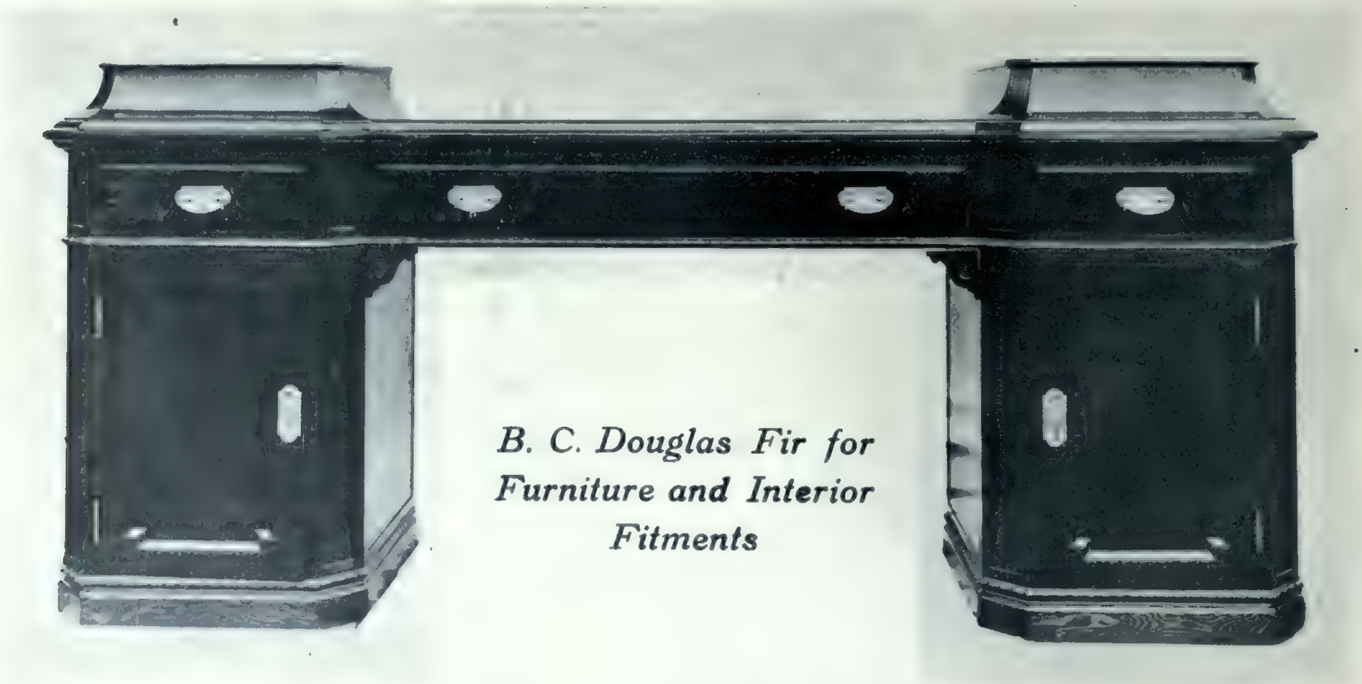
Auguste Rodin, the French sculptor, has executed a deed of gift to the French Government of his own and other works of art forming a collection in the Hotel Biron. The future Rodin Museum is filled with his works, some barely begun, others entirely finished. The Hotel Biron has been the nunciative, the Russian embassy, and the home of the Dames de Sacre Coeur, and has a most interesting history.



B. C. Douglas Fir for Furniture and Interior Fitments

ARCHITECTS and furniture designers will be greatly interested in the possibilities of B.C. Douglas Fir in connection with high-class interior fitments and furniture. The accompanying photograph illustrates a buffet built entirely of this wood, designed by Mr. S. MacLure, the well-known architect of Victoria, B.C.

The buffet illustrates very clearly the excellent results obtainable in Douglas Fir for this class of work. All framing, stiles and rails are of the wood cut edge grain, while panels, door fronts and friezes are of rotary cut three-ply veneer.

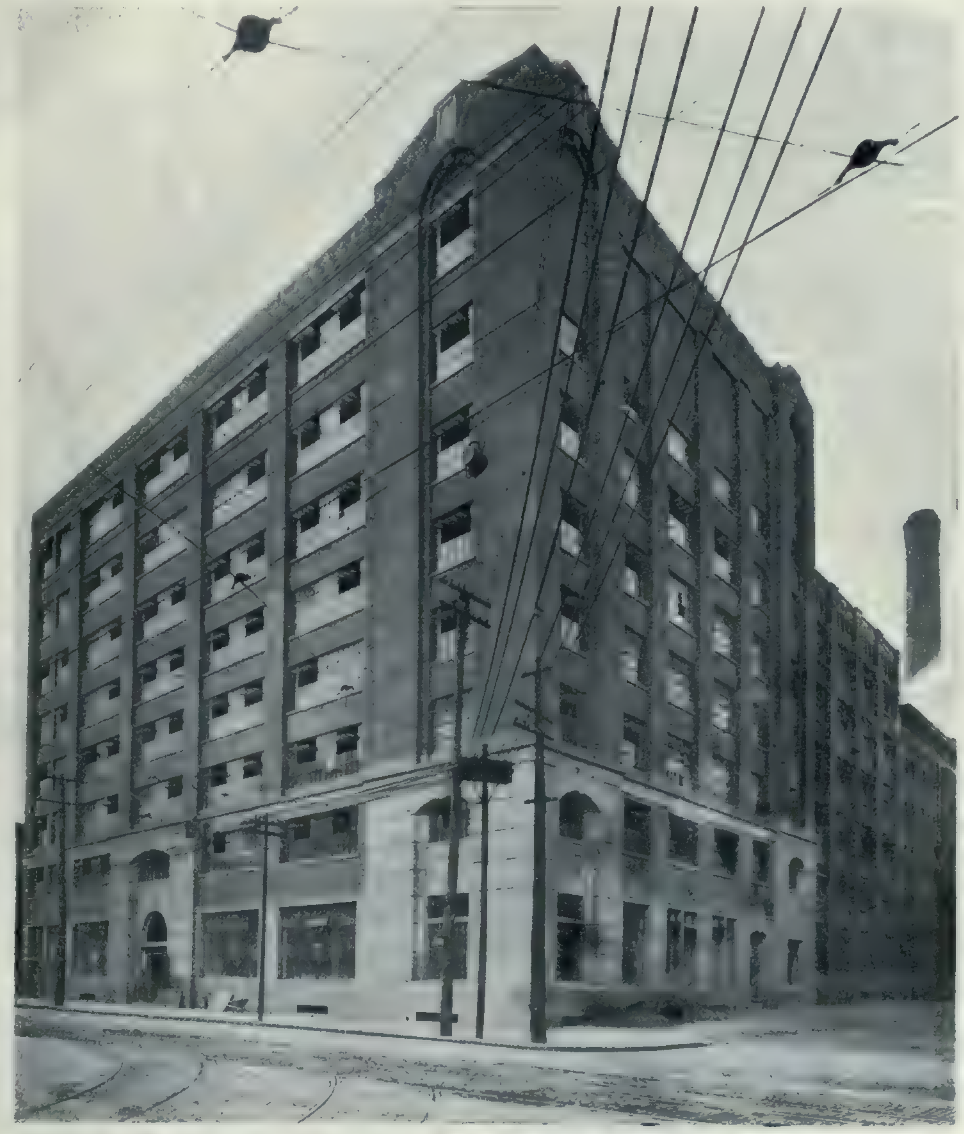
Many furniture manufacturers in Eastern Canada are showing great interest in British Columbia as the source of supply for their raw material. For woods of the highest class at moderate prices, British Columbia offers a product second to none.

Christie, Brown & Co., Ltd., Factory, Toronto

Sproatt & Rolph, Architects. Jenning & Ross, Architects.

THE special features of this factory are its fireproof qualities and method of construction, whereby the largest possible amount of light is obtained.

The metal frame windows are of maximum size, and the interior is white tile. It is only by a perfect lighting system that real cleanliness can be obtained, and that absolute purity ensured that should always accompany the manufacture of foodstuffs.



FACTORY AND OFFICE BUILDING OF CHRISTIE, BROWN & CO., LTD., TORONTO, ONT.

The new building has two staircases, one at the west and one at the north end, the former being specially reserved for fire emergency. A feature of the stairs is the painting of the corners of the landings white, thus serving two useful purposes, making them more readily discernible and preventing the collection of dust and dirt there.

Another prominent feature is the automatic sprinkler and fire alarm system.

The eighth floor contains six ovens placed at the top of the building in accordance with the most modern baking methods. The baked products are fed down through automatic conveyors to succeeding floors for packing, etc. Each oven is independently driven by individual electric motors.

All elevator and entrance doors throughout the building are metal covered and fireproofed.

On this floor is installed a settling tank for removing sand and other impurities from the water, thus giving longer life and efficiency to all valves. The tank in the water tower supplying the sprinkler system has a capacity of twenty-five thousand gallons.

The seventh, sixth, and fifth floors are devoted to packing, each table being so designed as to automatically feed the same quantity of biscuits to each packer.

The fourth floor holds the stock of paper and cardboard, and the second floor is used for flour storage.

The third floor is the mixing room, and contains four large mixers of most modern design, individually driven by electric motors.

The whole of the ground floor is occupied by the general office, with the private offices at the east end.

The internal woodwork is of oak, the ceilings being white, and the walls a pale green. Here, again, lighting has received special attention, the ceiling being sixteen feet above the floor, and the whole of the front facing south being glass. The artificial lighting is taken care of by semi-indirect glass bowls with one hundred watt nitrogen lamps.

A feature that should not escape mention might well be more generally adopted, namely, the whole extent of the front windows is filled with growing ferns and palms, giving an air of

CHRISTIE, BROWN & CO., LTD., BUILDING. OFFICE BEFORE SCREENS WERE INSTALLED. (DARK LINES ON BEAMS AS BRICKS FOR SCREENS).

restful distinction both inside and out. The floor is Terrazo Mosaic. Communication from the office to all parts of the factory is by the Bell and Automatic telephones, and Lampson tubes carry order sheets to the shipping departments.

An Autocall System extends throughout the factory for calling individuals.

The basement contains store rooms, lavatories, etc. These are fitted with shower baths and all modern equipment, and rest and luncheon rooms are also provided for the office staff.

Work started on the 2nd January, 1913, and completed August, 1914.

A test hole was sunk to rock forty-two feet from the sidewalk level, and it was decided to sink all the footings to rock. The main excavation was started first, and as subgrade was reached, the caissons were at once put down.

The material encountered was boulder clay, and great annoyance was caused by boulders in the caissons which ranged from one-quarter of a cubic yard to three-quarters of a cubic yard. The sinking of most of the caissons was comparatively simple, however, those on the north side of the new building had to be put down beneath the old building, and four columns, and also the corner of the old building had to be underpinned. There were forty-nine caissons sunk to rock. The seven caissons to the west were constructed alongside the wall of the building to the west, this wall being supported in the meantime.

The south side of the old building was then supported from bottom to top with temporary shoring. The old columns and beams taken out and replaced by stronger material to stand the heavier floor loads of the new building. The old building showed no settlement.

The building is constructed of cut stone, brick, steel, and reinforced concrete floors and steel sash.

Wherever possible Canadian products were used.

All steel work is fireproofed, and the floors are concrete surfaced with trap-rock. The reinforced concrete is beam and slab construction, steel bars being used for the slab, and expanded metal used in the fireproofing of the beams and columns. The brick work is made of selected red brick, and the interior white enamel brick.

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An immense boulder of granite that had stood since pre-historic times on the prairies, eight miles from Lawrence, Kan., has recently been quarried for monumental purposes by an enterprising granite firm in that city. The stone, which it is believed was brought to the spot by glacial action, is a rich red granite without a flaw. The granite men paid about twenty-five dollars to the owner of the land on which the boulder stood for the privilege of quarrying the stone, and their only other expenses was the labor of two men for two weeks to break it up into sizes convenient for handling.

CHRISTIE, BROWN & CO., LTD., MAIN OFFICE.

Architectural Problems Raised by The War

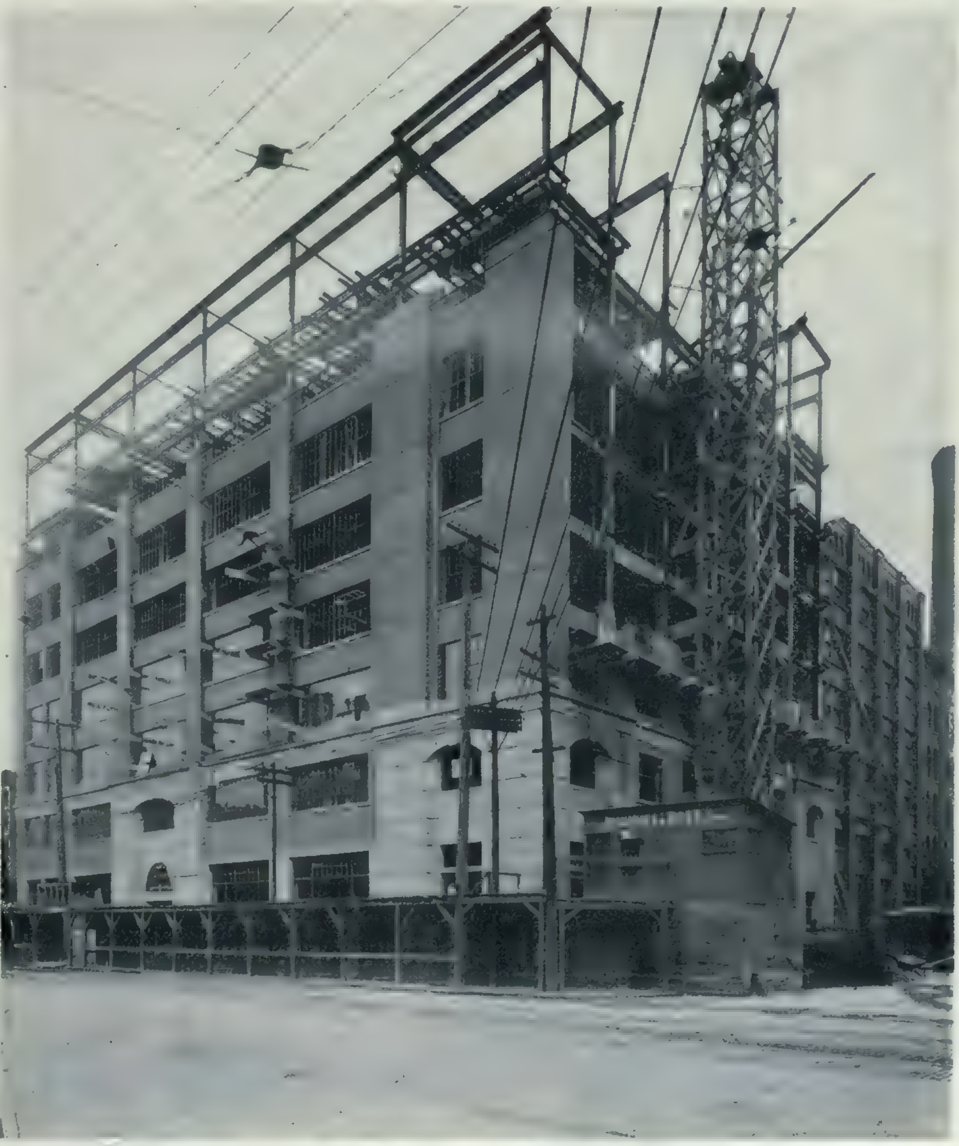
Addresses by Captain R. Burns Dick, Royal Garrison Artillery, President of the Northern Architectural Association of Great Britain, under the Headings of "The New Epoch" and "The Cataclysm—And After," have a Direct Bearing upon Situation Here.

The New Epoch

Gentlemen,—A year has passed since I had the privilege and pleasure of addressing you as president of the Northern Architectural Association. I find myself for a second year in that honored position, and would at the opening of a new winter session take this somewhat tardy opportunity of thanking you most sincerely for the honor you have done me.

If perchance in the years to come some member, perhaps a budding president of this great, and in that future time much greater, society should take it into his head, out of an idle curiosity, or maybe for inspiration for his coming address, to glance through the presidential addresses of the past, would he be struck by anything singular about so apparently commonplace an opening as that just uttered? No doubt he would wonder how it happens that, in what he very properly would suppose was a live institution, the president does not address a meeting from one year's end till the next. But if he glances at the top of the page and notes the year 1915, the second of those fateful years seared deep, literally, with the branding irons of fire-forged steel, into the history of his country, he will understand; and I would crave your indulgence while I have a word with this my distant successor.

"Well, son of the future, if you are merely curious, read on; but if you be my unborn president searching for professional ideas from the past, you may pass along, for here you will find little for your purpose. A president who has not only entirely ceased to pursue his work of construction, but is vowed to and frankly eager for destruction, who no longer controls the craftsmen engaged in displaying in concrete form the growing wealth and advancement of a nation, but, on the contrary, is employed with these same workers in studying how best to make use of mighty engines of war, in blasting off the face of the earth the ingenious barbarians who would dare to lay their bloody grasp on that nation's most sacred possessions—such a president can be of little assistance to you who live in happier and more settled times. To him an architectural address at such a time is unthinkable. Like so many of his professional brethren, he is engaged in the common duty of preserving what has been entrusted to him by his fathers from the polluted touch of the despoiler, but unlike so many who are paying their debt in the forefront

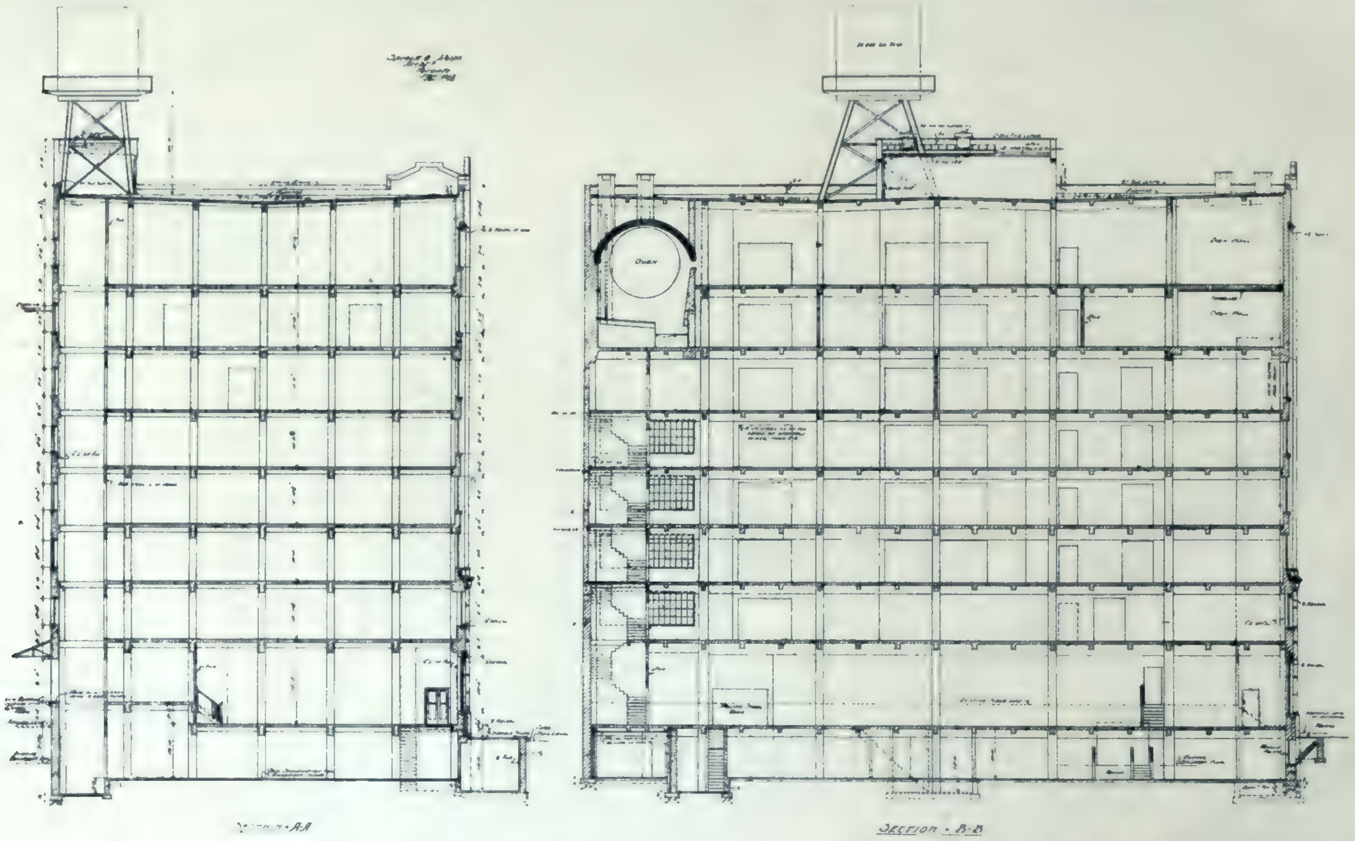


CHRISTIE, BROWN & CO., LTD., BUILDING, KING AND FREDERICK STS., DURING CONSTRUCTION.

of the conflict, and those who, alas! have paid their all, his lot so far has been to watch and wait; and so he is permitted after a year to fulfil a small part of his obligations in thus addressing his fellow-members of the N.A.A.

"But stay, my scion of a noble profession; whatever your motive, I would have you read on, for I doubt not that as the recorded thoughts of the most obscure worker of the age of Pericles would be perused with avidity by us to-day, so the views of one living in a mighty age of your ancestors will prove interesting, if not curious, to you who possess a knowledge unknown to us—a knowledge for whose secrets our age is delving to uncover for your enjoyment.

"Forget not that much of that which you enjoy, of that superiority of knowledge and power, of that enlightened outlook on life, of that toleration and sympathy which seem so lacking in this age, of all that seems to place you so much above this age of selfish and senseless conflict, has been built up on the maimed and dead bodies of those who would rather give up life itself than that those ideals to which you have attained, and of which you are so justly proud, should be sacrificed to the god of ruthless force.



SECTIONAL ELEVATION, CHRISTIE, BROWN & CO., LTD., BUILDING. SPROATT & ROLPH, ARCHITECTS.

"No class in what we believe to be the enlightened nations has withheld its contribution to this struggle for beauty in human life, least of all the profession to which you belong. This and other societies throughout the Empire today mourn the death in battle of some of their most promising and talented members, whilst thousands of architects and students of our art have taken up arms to preserve and foster this beauty.

"We can admire force and strength in their many manifestations. We will not withhold the admission that the visible expression of rugged and unrestrained power rouses in us a sense of admiration—that even a certain beauty of form may be associated therewith; but we do not confuse this feeling with the sentiments aroused by the beauty that is born of the graces and nobility of the human soul. We can see in the cruel and stealthy movements of the tiger, with its form so wonderfully expressive of latent power, something that arouses in us a sense of perfect fitness for the functions of its being—functions that call for craft and energy to make the spring upon its weaker prey. But though we admire this work of Nature, we hesitate not to destroy it in order that the still more beautiful form of man, with its equally perfect fitness for its functions, which include the use of its strength for the protection of the weak, may survive.

"And so, my friend, we architects, who are citizens first and custodians with all Britons of the riches bequeathed to us, are chiefly concerned at the present, like the tiger-slayer, with the destruction of an admittedly remarkable manifestation of power, which would be well worthy of preservation and use if it could be tamed. This untamable foe of ours, in his national monuments and wherever there is room for it in his architecture, breathes his spirit of arrogance and dominating force; his brutal soul exhales through his works the fœtid odor of the jungle monarch. It is great, this animal majesty, but it is a thing to be kept apart, confined behind bars, or better still, deprived of life, and its harmless carcase preserved for the students of evolution.

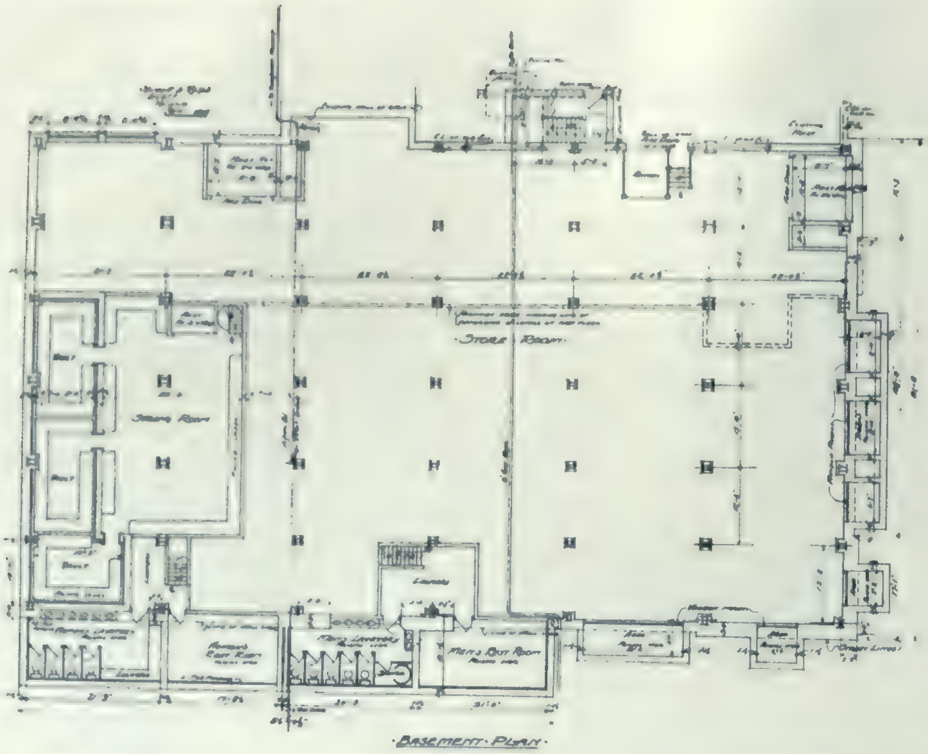
"You, no doubt, on your brief vacations, have sped over the North Sea in your air-car and visited these wonderful old specimens of the jungle age in Germany, and with a sneaking admiration have gazed upon them and pondered over the perversion of intelligence that created them. But if you are tempted to regret that something of force has disappeared from architecture by the suppression of the would-be superman, remember that the freedom which permits of the untrammelled expression of the best that is in you and which has resulted in the great advance your age can claim over that when George V. was King, is only possible by reason of the breadth of sanity of Britain and her Allies, which dissipated the poison gas of the Teuton monster. While I write, the task is still uncompleted, but when you read it will long since have taken its place in the list of accomplished facts that have opened up the wider and fuller life which you enjoy. I would I could project my vision into the life of the future, and so provide a stimulus to my fellow-workers of all creeds and trades. They, however, no matter what the sacrifices, will see that posterity is not betrayed.

CHRISTIE, BROWN & CO., LTD., SEVENTH FLOOR, SHOWING BOTTOM OF OVENS FURRED DOWN.

CHRISTIE. BROWN & CO., LTD., EIGHTH FLOOR, SHOWING WEST BATTERY OF OVENS.

"Adieu, friend! I have confidence that what you have received at the hands of your sometimes blundering ancestors will be well guarded by you; for are you not trained to war as well as architecture, and are you not ever prepared and organized to crush with force the hydra that will for long ages lie in wait for the time when the watch is relaxed and the time seems ripe to strike for world-power? Watch ever, and above all be armed! Adieu!"

Now, gentlemen, to justify such a claim as I have just made in the eyes of posterity we have strenuous work before us. This is no time to pursue the old way, with nose up against the dry bones of archæology, trying to tear the souls out of old corpses that ceased to possess them long since when their purpose was served and their course run, like everything that is born, whether of the travail of a woman or the sweat of a man; no time even to consider the practical problems that so properly engaged our attention in normal times. We must now use every endeavor in our power to defeat the forces that are deliberately upsetting all those conditions on which we based our course of action in solving those many problems. Until the horrible disease which has seized hold on mankind has been stamped out, our work is useless. We must commence the process of inoculation that will protect against a recrudescence. We must find the serum that will destroy or make innocuous those germs of mad ambition.



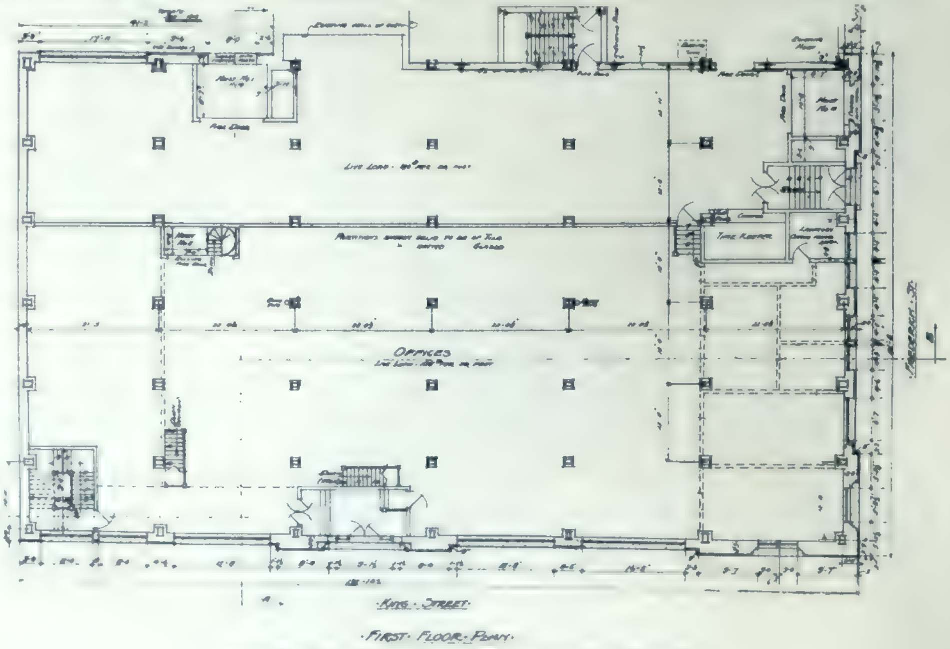
CHRISTIE, BROWN & CO., LTD., BUILDING, TORONTO.

But this disease, having once laid hold on man, will leave an indelible mark upon him, and though I believe he will emerge stronger than ever, all his future course will be marked by the measures of protection his prudence suggests.

Now, as man's ingenuity and adaptability are boundless, it is impossible to forecast with any certainty the form these protective measures will take, but no time must be lost by us in setting to work to evolve them. In our particular domain the influence of this time will be very far-reaching, and one is impelled to a little speculative thought as to what lies ahead. Curiously enough, on attempting to pierce the veil of the future, my mind instantly flew back 2,000 years. The impulse was irresistible, and the explanation simple. No sooner had I formed the concept *war-architect* than my memory automatically ejected out of one of its "pigeonholes" the same combination, labelled "Vitruvius, appointed by Cæsar Augustus architect in charge of the engines of war."

We have all read Vitruvius, that shrewd writer on architecture, and with a certain amount of amusement perused the list of attainments he considered an architect should possess; not the least of which, judging from his tenth and last book, was skill in the design and use of war engines. You recall the, to us, humorous description of one city architect who devised a great weapon for the siege of a rival city, and the more than ingenious architect who reduced his rival's skill to nought and saved his country from defeat. Some of his advice may appear amusing, but old Vitruvius was a serious writer with a great knowledge of his craft, and was as devoid of conscious humor in his writings as a German reply to an American "Note," though distinctly shrewd and worldly-wise, as for instance when he treats of the choice of a situation for various buildings. For a temple to the "Goddess of Health and such other divinities as possess the power of curing diseases," a site with *wholesome air and pure water should* be selected, where the sick will more readily recover and a *reliance upon the divinity be thereby increased.* In other words, "Trust in the Lord, but keep your powder dry." Well, I can see the time returning when the architect will again play an important part in the device of methods to protect his city from the assault of the foe from without; and we would do well to show the wisdom of Vitruvius as displayed in his recommendations on the choice of a site.

We must first grasp the import of this great upheaval; this is not the final war, it is the first of a new epoch. No matter how or when this conflict comes to an end, can anyone picture a peace that will be anything but the pause of ex-



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haustion? We are a peace-loving people, and I believe would be content to remain so if it were possible; but though there are people amongst us so afflicted with incurable myopia as would lead them to accept peace now, the slumbering war spirit of our ancestors now being aroused by the aggression of other peoples is likely to take a more or less permanent set, and indeed will of necessity require to do so if we are to be in a position to meet the fresh assaults on our existence as a nation which will assuredly follow in the not distant future.

One potent factor which seems always to escape the well-meaning world-pacifists is that so long as you have mankind divided up into different races, with different languages, different religions and traditions, different ideals, customs, and modes of thought, and different views of each other's importance in the scheme of things, so long will you have strife. This is no new condition, but it is one that must be ever reckoned with; it is the one from which this and all wars have sprung, and must be treated as permanent, so far as the shaping of our future action is concerned. This has been of necessity accepted by all progressive peoples and acted upon accordingly, with results varying as their relative skill and foresight.

In our case, Nature and a supreme Navy, which we have gradually come to assume as all that is needed to comply with this elemental necessity, has lulled us into individual detachment from world strife. So much so that even in the throes of a death struggle for existence we have one of the most amazing exhibitions of the workings of the human intelligence that history has to record. These means of self-preservation having failed as complete measures, the extraordinary question is under consideration as to who amongst us shall take on the burden of facing the enemy, who shall leave his private and business affairs to take up his long-neglected shield and sword in his own and his country's defence; shall every citizen as a matter of course be called upon to do what he is considered best fitted for in the crisis; or shall it be a matter of chance, left to the individual? Amazing indeed! The means hitherto considered sufficient for our self-preservation, if they have not already failed, will do so. Our magnificent Navy, as at present constituted, and the enveloping ocean will prove inadequate in themselves to our maintenance of power, by reason of the ingenuity of man in discovering new methods of exerting his offensive force and of overcoming all barriers to attack on his enemy's territory.

No matter what our scientific experts may have said about the limited possibilities of airships and aircraft generally, I think we are beginning to see that they are to be treated seriously. The whole science of aerial navigation is in its infancy, and anything is possible. Certain it is that, as a barrier to serious offensive action on these isles, our sea power is within sight of failure—I don't say in this war, but we have already received notice and cannot afford to ignore it. If a commanded sea barrier, such as we have, fails, no country, however strong her land frontiers may be, is now immune from the attentions of the despoiler and violater from without.

The power developed by the skill and genius of the scientist and inventor in all directions, and now so evident in warfare, has brought about that great revolutionary change that puts a period to one epoch and opens up another. Do we realize what this means; that henceforth there is no distinction between civilian and soldier? Those glaring press headlines: "Barbarous attack on undefended port," "Zeppelin outrage on Tyneside; murdered citizens,"—these will gradually disappear when we awaken to their absurdity. As Monsieur Leche points out in his "Les Guerres d'Enfer," it is no longer paid professional armies that go out to do battle, whilst the citizen carries on his usual business, treating the campaign as a matter of interest in his moments of leisure. Henceforth, it is nation against nation in the literal and fullest sense. Whoever makes munitions of war: man, woman, or child; whoever clothes and feeds the fighters; the inventor, scientist, and financier, the brains directing operations, the payer of war taxes, the hewer of coal, everybody practically—all are belligerents and can no more expect to be immune from attack than the man in the trenches or on a destroyer.

Germany has shown the futility of treaties and international military laws. Make them by all means, and keep them if you can, but be prepared to meet those who don't on at least equal terms. The truth of the saying, "If you want peace, prepare for war" is being realized more and more as the days go on. The price of the most costly preparation to demonstrate our invincibility would have been as nothing to the expense we are now being put to to preserve our existence; but, above all, think of the outpouring of blood that would have been averted. See to it that the lesson is learned!

To meet the conditions of this new epoch, and as a matter of self-preservation, I unhesitatingly assert that the only way is to organize and encourage a universal military habit as part of our daily life. I can see the expression of horror on the faces of those good people who live in terror of "Militarism." I see nothing whatever to fear from the general training of the citizen to arms. It is the one sure way to kill "Militarism"; no longer would it be possible, even if it had ever shown itself in Britain, for an exclusive professional military class to dominate the nation. The nation itself would be the army, and would not lightly forsake its peaceful pursuits at the behest of the professional fighter. I see nothing but good in such a change. If it only bred in the individual a sense of the duty he owes to his country, a sense so many clearly lack, it would be well worth the loss of our so-called freedom. Militarism. A bogey! Are the French more bellicose than we? Does the average Englishman, trained to the scientific use of his fists, go blustering round to demonstrate his prowess, or is not his bearing that of a quiet confidence in his ability to defend himself or chastise any aggressor against the weak? What does England not owe to-day to the Volunteer and Territorial? I am very proud of my "T." and in all the years I have been associated with these civilians trained in military practices I have seen no shadow of the spirit of Militarism; but I have seen a marked improvement in the bearing of these men who have in times of peace voluntarily submitted to military discipline, which though limited was always real. I have learned as I could never otherwise have done to appreciate the sterling qualities of the Northumberland miner. I mention the miner because my experience has been more with him than other classes. But artisan, laborer, miner, commercial and professional men, no matter what their class or *metier,* effect a *rapprochement* and mutual understanding by this military association which no other means so effectually afford. "You want peace, take it then," said Napoleon. Take it by your power to command it.

Interwoven through the fabric of national life must be an ordered arrangement for defence, which will be the motif of its pattern. But this new order of things must no longer be left to a few Government departments to deal with. It is everybody's business, and upon that fact being thoroughly grasped depends our existence as a first-class Power.

If we architects were suddenly called upon, as we very soon will be, so to shape the plans of our new public buildings and the laying out of new town areas with special reference to the demands created by the new conditions that are looming up before us, we would be somewhat nonplussed. These new conditions have not yet definitely taken shape in the minds even of those who are most intimately mixed up with the swiftly-crowding events that are in process of crystallizing them. There are no Government departments to which to apply or from which have issued any regulations. These departments will materialize in due course, but on old methods they will prove too cumbersome, extravagant and inefficient. With a nation composed of individuals brought up to look upon personal liberty as the greatest heritage bequeathed them, free to follow any selfish inclination or ambition they choose, so long as they don't stand in the way of their neighbor doing the same—a people untrained to co-ordination of thought, without common ideals and without understanding as to the national duty that a modern World State of necessity imposes on its subjects—a people who are only spasmodically galvanized into a noisy display of patriotism by Press and paid politicians when events threaten a wound to their pride or a loss to their pocket —with such a people no new method is possible.

It is no use blaming the bad or indifferent work of Government departments. These you form, and having appointed officials you expect them to do all your thinking for you, so far as it concerns national business. Why are we criticising the conduct of the war by the men we have loaded with the responsibility for its successful prosecution? We are responsible. If one of your clients doesn't know his needs nor his means, and won't take the trouble to find out, he cannot blame you if the alteration and extension to his house are costing more than he can afford and are not to his liking. Conscription, national service, State organization of men and material—call it what you will—we are told is contrary to the genius of our people. Then the sooner we take thought to ourselves and alter our genius the better, for I, for one, do not believe that our genius is incapable of the addition of a cubit to its stature by an effort of will.

If we continue for a time to succeed without this co-ordination of our activities in the direction that the obviously new order of world politics imposes, we will not have to congratulate ourselves on our perspicacity, but rather on the surprising fact that no other nation has seized upon the obvious means of extending its power. Be not deceived, however; you cannot stamp out in a generation or two the ambitions of a people, and the nation that has been the means of making this national unity of thought and action a necessary weapon of defence on the part of other peoples will not lightly drop it as a weapon of offence because it may have failed in its first use. It is only a matter of time, and the weapon will have been given a keener and more deadly edge. Again let me say it: Not kings, not princes, not armies, but nations are at war as they never were before. You and I and everybody are called upon to fight our present enemy, and will never again be able to entrust the work to a small section of the community called the Army and Navy, magnificent as ours have shown themselves to be. A revolution in educational methods will have to follow. The rising generation must be gradually brought to assimilate the idea of individual responsibility in national action, to develop a sense of pride of country and a willingness to self-sacrifice in defence of her honor.

We have already reached a stage when we consider it necessary in the interests of the community that everybody should be held responsible for the observation of recognized hygienic laws against disease. We are taught the value of fresh air and exercise, treatment of water and milk, burning of organic refuse, destruction of flies and other disseminators of contagious matter: in short, how to combat the destroyer of health and life. And yet we are content to be ignorant of the first essentials in the defence not only of life, but of what is more dear than life: honor, home, country.

Official departments, without the co-operation of the community, would ill combat epidemics of disease. No better will they succeed single-handed against our more deadly foes. Familiarity with the ever-changing conditions of warfare will be an essential part of education for the youth of both sexes. The weapon of the future will be a properly directed national intelligence—it will be mind against mind. The destroying gas waves, the flying shell, the bursting shrapnel, the death-spitting missiles from Maxim and rifle, the mechanical vultures and mosquitoes of the air, the engined destroyers of the deep, the burrowing atoms of humanity, sapping their way to each other's vitals—all will be but as the flying electrons from the radium of the nation's brains. In the mountain of pitchblend that is the British Empire we have untold stores of the radium of intelligence, but it must be extracted to be of use, and that cannot be done without the proper plant. Set up the plant in every school and university, in every home and institution, in every church; preach familiarity with every weapon that may be used in our country's defence, so will you have peace and the calm to nurture those Christian virtues she holds up as her ideal.

When our foes are beaten to earth and the sword is sheathed we architects must be in the forefront of those who lay the foundations of this remodelled national structure. Let us be the first to formulate plans for its extension and alteration, such as will condemn all decayed and useless parts, preserving only the firmly based and soundly constructed core, in which are preserved the glorious traditions of a thousand years.

In this new national structure the ideal to aim at, it will be agreed, is to construct it and maintain it by the best intelligence available. It cannot be contended that this is the basis on which is reared our existing national and local government. Suppose it is contended that it is fairly representative of the average intelligence of the people. That is not enough. However equitable it may seem to give an equal vote to every man (and woman if you will), an equal right to say how we must proceed; such a method is unsound and illogical, seeing the immense gulf that separates the intelligence and character of one individual from those of another. The noblest and best must rule in the new State, not the average. A beautiful theory, but how is it to be applied? It is a difficult problem, I admit. Perhaps you will say it is impossible. Then I would remind you that, as one of our French friends says in speaking of war operations: "Il n'y a que l'impossible qui reussisse." Who amongst us in his small way but has felt the thrill of exaltation at having achieved the apparently impossible? It may take generations to accomplish it, and it will require the application and genius of many brains to solve it, but the sooner it is commenced the sooner shall we see the fruition of our efforts. The flood tide in the affairs of this nation is approaching which, if seized, will bear us on to fortune.

Let me compress this nebulous idea into some semblance of form, feeble though of necessity it must be, lest I be accused of empty phrasing. Let me, as an example, take our local government, and suggest how the best intelligence of our city might be applied: To begin with, there would be no room in my new council for the man whose only qualifications are leisure, ambition, a ready tongue, a fat purse, or personal interest to serve.

I know that we have, and in almost any system might have, men of wide experience and intelligence and lofty motives on local councils. Indeed I think we are more fortunate in this respect than in many districts. But the system is too haphazard; there is a lack of balance in the character and experience and order of intelligence forming the combined wisdom of our rulers. The wisdom is representative of the council's members, not of the highest intelligence of the citizens.

Say there are forty members required. If you take at random forty good average citizens, you have a council equal to most elected on the present system. Each will express his own views, or at best what he conceives to be those of the class from which he is selected, not the studied views of the best thinkers of that class upon city affairs. A new way of representing what I hope will be in the future the coordinated intelligence of the community on the council must be found; and to clear the ground for a reconstructed system I would wipe out ward representation and the voluntary representative. What would I substitute, and how? Well, the necessary machinery for my new system, with a little development, is already in existence. Instead of making use of the ward divisions, divide the population into sections, each representative of one of the various interests which form the life of the city. These sections or "interests" are nearly all defined and more or less organized in their respective associations or unions. How many branches of activity would thus be represented would depend upon the size and character of the community concerned; for instance, the shipping interest might be very large in one place and non-existent in another. Having settled on the number of "sections" in any district, each qualified elector would by right be entitled to become a member of that which he considered most nearly represented his business or “interest.” Each section or “interest” might supply a representative to the council, whose duty would be to advance not his own personal views on vital questions affecting the city's welfare, but the studied view of his “section” arrived at through its committee and council. These representatives might be paid permanent officials of their societies, presidents, or members specially selected for their peculiar fitness, acting for longer or shorter periods as the exigencies of the city work required. The size of the council could thus be reduced, for though it might be considered that one “interest” being so large compared with another should have a larger say in local affairs, this could be done by giving increased voting power to the representative of the greater.

The local authority would then be a collective organization at its best, composed of representatives of all branches of local activity: military, educational, legal, financial, commercial, labor, medical, architecture, and building, engineering, social, religious, etc., etc., all giving the result of co-ordinated effort in their respective spheres to the furtherance of communal interest and advancement. There is no individual citizen that could not be included in at least one of say fifteen to twenty such “interests.”

It would be the duty of each of these societies or “interests” to form what I might call a “Foresight” Committee devoted to the study of the changing conditions affecting their special spheres of activity and their possible influence on the affairs of the community generally—to anticipate events and formulate proposals to meet them, and to confer with similar committees in other sections, finally voicing the result of their deliberations through their representative.

All this would of course involve a decided change in the attitude of the individual towards public affairs; but unless this does take place no improvement is possible. The lethargy and indifference of the average citizen is indisputable, but it is largely due to lack of any organized method whereby value can be given to his active interest, and I believe that, apart from the urgent necessity of greater interest in public work, our best men, under a system where they are assured of being able to exert their influence, would find a keen zest in using their knowledge and experience for the general weal.

These “sections” would no doubt require considerable reorganization to adapt them to the new conditions. Our society, for instance, while the purely professional work could proceed more or less as at present, would require to extend its activities and make its members realize the obligations of their citizenship. Matters of public concern generally would have to come within their purview. There is no doubt that such an extension of activity would re-act very favorably on the professional side of the association, quickening the interest in all directions.

What a field for the imagination of our “Foresight” Committee would open up; what opportunities for the application of this gift in the reconstruction of our cities. I can hear some city father saying: “We don't want the dreamer and the visionary on our councils; we want the practical man.” My answer to that is that, in my opinion, the one man on committees (building committees, at any rate) who is a real drawback to the satisfactory prosecution of any work is the so-called “practical man.” He is usually a man of very limited, if practical, knowledge; unimaginative and of very narrow outlook, fearful of losing caste amongst his confreres by admitting any inferiority of knowledge, and whose influence, if allowed play, is more often than not reflected in inferior, uneconomical and inefficient work, barely sufficient for the needs of the moment and showing no intelligent anticipation of the needs of the future. We have plenty and to spare of these men; we want the man of imagination to give some idea of what may be demanded in the future from the work of the practical man of to-day.

It might be possible to extend some such system as I have sketched so roughly to national government. Nearly all the societies and unions throughout the country are affiliated to, or together form national or central societies which might, by their respective representatives, form a much reduced and more efficient parliament.

But whatever system the genius of the people may devise for the utilization of its best brains, we must not wait till the change is accomplished. We must begin to think now, so that when the present crisis is over such action can be commenced as will add its quota in bringing it about. Pending the arrival of that more enlightened time, we, like all other already organized societies, might start by forming our “Foresight” Committee, and, in season and out, use every endeavor to enforce our right to being heard in the local councils on matters where our special training and experience must of necessity be of value to the community. We must no longer be satisfied with the laying of our communications on the table, and our views treated with suspicion as emanating from an interested source. We must learn to command respect by showing that our actions are dictated by a desire to further the general good and not to pander to selfish interests.

In the time to come, when the national life is permeated with the spirit of patriotism—the real patriotism of service to country—and a determination to put down with force if necessary any signs of aggression or despotism on the part of other nations, such problems as we are now called upon to face will look after themselves, for then they will be constantly, and as a matter of course, under consideration as an essential to the nation's position in the world. But, in the meantime, the first and greatest problem that we must take up is how to shape our future plans to meet the danger that in a few generations will again confront any nation unprepared to defend itself against the new forces that will be employed by the enemy bent on conquest. Our "Foresight" Committee might well commence by studying the effects of the military offensive against cities that is just beginning to develop. This opens up a very large field for thought and ingenuity. Building construction must be considerably modified. The planning and general form of public buildings will undergo an appreciable change, and indeed the whole design and appearance of cities will alter, not only in the normal way due to the advance in scientific and industrial methods, but directly to the growing power and destructiveness of outside attack, chiefly from overhead.

I can see the gradual increase in the proportion of open spaces; the general introduction of underground or double-decked roadways, with their solution of traffic problems combined with safety for the population; the general adoption of covered and arcaded footways on the lines of the Ritz Hotel, Piccadilly, having easily actuated steel shutters; the general return to shuttered windows of special design, and the entire absence of inflammable material where exposed to incendiary attack; tiled and slated sloping roofs entirely abandoned in favor of very strong flat roofs specially adapted for anti-aircraft appliances, and, in the case of large or continuous blocks of buildings, without parapets and specially prepared for the landing and housing of avions. I can imagine the national treasure-houses being remodelled; picture galleries with suspended wall linings on which the pictures are fixed, and which could be swiftly dropped to their safety vaults below; museums, with their cases of treasure, their statuary, and so forth, arranged on continuous lift platforms similarly capable of being lowered to a place of safety by the pressing of a button; schools and similar public buildings so modified as not only to show the large part that national service in its wider sense plays in education, but also to make them immediately available for the accommodation of the citizen in arms at the signal of alarm; manufactories, where the worker on mobilization orders becomes a soldier with his allotted place, so arranged as to become his quarters in war until required elsewhere; the creation of new types of buildings and athletic areas for the systematic training of the citizen soldier, and the education of the woman in her important duties in time of war. I can also imagine a network of subways linking up important centres, and the permanently constructed and well equipped trenches protecting the great industrial centres; great electric generating stations entirely underground, supplying the lighting and motive force for industrial, domestic, recreative and war requirements; great Government laboratories for scientific and engineering research; and so on, and so on. Each thinker according to his knowledge and imaginative faculties can make a mental picture of the aspect of future centres of life—all probably very wide of the actuality, but none more widely divergent than will be the change from the present state of affairs.

A "Foresight" Committee's duty should be to be, if anything, in advance of the times, in order that our progress shall march with the ever-changing conditions and requirements of the life of the new epoch.

Now, gentlemen, I must cease flicking the surface of this vast problem and leave you to go deeper if you will. I cannot expect you all to agree with my theme; I should even be prepared to hear the opinion that I had abused my position in voicing such views before a professional society. Yet I make no apology for so doing, for at such a time as this I feel perfectly justified in attempting on any available occasion to influence others to an earnest consideration of what I feel to be a vital matter to the nation first and to us as architects afterwards. If I arouse active opposition to some of my beliefs I care not so long as I succeed in stimulating an interest that may bear fruit in action when the fast approaching time arrives. Until then let every ounce of our combined weight be hurled against our foe. In every way possible let all of us, old and young—for remember we are now all belligerents—emulate the courage and patriotism of those who are bearing the heat of the battle. Of our members and those who have been connected with us no fewer than sixty are with the forces; many have been wounded, and, alas! we have to record the supreme sacrifice to King and country of four great souls whose memory will live on and add their lustre to our annals—George E. Hunter, A. E. Lowes, R. Mundle and F. Lawson are gone from amongst us, and yet are they not to be envied—for

> "*How can man die better than in facing fearful odds*
> *For the honor of his country and the temple of his gods?*"

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The Cataclysm—and After

Gentlemen,—For the third consecutive year I am privileged to take the chair at the opening meeting of the winter session of this association as its president. This unusual fact is not one on which I am permitted to congratulate myself; it is merely one of the smaller effects of the universal upheaval that has changed the whole course of events in our national life. Whither leads the new movement is more than can yet be surmised, so perforce are we compelled to mark time till the way is clear.

I am fortunate in being able to attend this the first general meeting of the session, and I feel that much will not be expected of me in the way of a presidential address, or, rather, that you will be very indulgent to me. I shall confine myself practically to one thought, and that the influence of present events on the citizen's attitude towards the city beautiful. As to the work of the association, there is little to record during the past year. A certain amount of time and thought has of necessity been devoted to the affairs of the society, but though nominally your president, I have taken no part in the work owing to my military duties. Your vice-president, Mr. Errington, who would in the ordinary course have occupied the chair to-day, together with our capable hon. secretary, Mr. Hicks, and the council, have done all that was necessary and possible under existing conditions.

Though the war has produced the disastrous effects for our profession that were to be expected from the curtailment and uncertainty imposed on all peaceful industry, it has unfortunately been found necessary to put a stop to much of the work that was left to us, in order that the output of munitions might not be interfered with. It is something, however, to know that every case is properly investigated before permission to carry out work is withheld, and from the knowledge I have of those controlling the investigation, I am sure everything is being done to minimize the burden put upon us.

I have mournfully to record that death, the uninvited and never welcome guest, has descended upon us as never before. A past president, in the person of Mr. J. W. Taylor, has been taken from us, leaving behind him the memory of an earnest worker for the welfare of the N.A.A., whose long roll of members has been enriched by his name. Mr. J. W. Dyson has also passed away, depriving us of a valued and useful member. The society is poorer by such a loss, and those of us who knew these two gentlemen will much miss the pleasant personal associations we had with them. But they have lived long and useful careers, which in the ordinary course could not have been much further extended. It is quite otherwise with those others whose names you have heard read from the Roll of Honor, who at the call of country have willingly laid down their lives on the threshold of the careers they had envisaged, and on which they were entering with high hopes and an ardor that might well have yielded so much that was beautiful and useful. We cannot accept the loss of these, the nation's gallant sons, cut down in the flower of their youth, with the resignation that follows on the death of those whose course is well-nigh run. Our hearts go out to the parents who have given to the State a beloved offspring, and we mourn with them the loss of long cherished hopes for a future, alas! arrested for ever. Admirable is the courage of those bereaved, who must feel some consolation in the belief that this supreme sacrifice is of more value to the future of the State than the longest career of a normal life. As Mr. Ernest Newton, P.R.I.B.A., wisely pointed out in his presidential address, the future will be determined for us by the men who have done the fighting, and whatever may be that future—and I think it will be great—it will have been made possible by the sacrifice of those who have laid down their lives at their country's call.

Gentlemen, terrible as seems the price we are paying, I have a full belief that posterity will not consider it too great for the results achieved. I believe that the changes which will be wrought by this conflict in every domain of our national life will be vaster and more far-reaching than any of us have any conception of. I will not venture to predict what will be the nature of these changes so far as they affect the sphere of work with which we as architects are concerned; all I would do is to counsel such an attitude of mind on the part of those who are compelled to stand clear of the actual conflict of arms as will respond readily to the new influences that will soon commence to operate—an attitude of mind such as will anticipate the needs of the new life and, freed from all prejudice and narrowness, will be ready to co-operate with the new desires and aspirations that will most certainly express themselves.

In my last address I advocated the establishment of what I called "Foresight Committees," and I still think much might be accomplished in the meantime by each of us so constituting himself, if only as a hobby in his spare time. I must also reiterate the views I expressed as to the tremendous effect that the new methods of warfare will undoubtedly have upon the actual form and construction of buildings and the laying out of residential and industrial areas. They will be as far-reaching as was the general adoption of new principles of construction in the past, such as the dome and the pointed arch, or as steel construction in the present. I am convinced, though none of us are likely to see the particular "set" it will assume, that this is the dawn of as distinctive an era in architecture and the arts as any of the well-defined periods in history.

The design and construction of habitations and the position and arrangement of mediæval centres of life were profoundly influenced by the prevailing methods of warfare, just as the succeeding period, the *soi-disant* Renaissance, was markedly affected by the invention of artillery, which aided in destroying those conditions that gave rise to moated strongholds, castles on craggy eminences, and the old walled cities of the Middle Ages. After four or five centuries of freedom from direct military influence, so far as the life and growth of our towns and cities are concerned, I believe we are again returning to a period when the effects of man's fighting propensities will once more show themselves in our habitations and mode of life, and a new phase in architecture will evolve.

Now, while this means that the "Renaissance" has practically run its course, I do not mean to suggest that it will suddenly cease. It will simply be gradually crowded out, as something tangible and decided and more in conformity with the changing conditions takes hold. In other words, the usual transition which separates every period from that succeeding is now commencing. Whilst I am emphasizing the part that the developing science of warfare will play in this dawning new era, I do not wish to suggest that that is the only factor in the change that is coming, though I believe this war to be directly responsible for launching the new order of things; for I believe it will materially change the citizen's outlook in a way nothing else could have done.

One of the things to which the sordidness of the surroundings and atmosphere of industrial life may be largely attributed is the inability of the people themselves to see that there is a solid and substantial return to be obtained from expenditure on spacious, healthy and beautiful surroundings in the centres where they work and live. Its practical and remunerative value, to put it on no higher basis, has been clearly demonstrated by such far-seeing men as the founder of Port Sunlight, where there is so much to delight the senses in the beautiful homes erected under his personal aegis, and where they and the character and happiness of the workers are in such contrast to the habitations and lives of the artisans in the vast majority of our industrial centres.

There are many far-seeing people who have been laboriously working to remove this reproach on our national life, and the result is being seen in various directions in the springing up of more or less satisfactory garden suburbs, founded on practical lines, and not on an unstable philanthropic basis. But it is dishearteningly slow work, because it is being practically forced by the few enlightened on an almost indifferent community. Until the people themselves realize the possibility of the infinitely increased happiness awaiting them in this direction it will never become general. The degree of beauty of a city is an indication of the enlightenment of its people. So long as the people remain indifferent to the effects of material environment on character so long will it be impossible to them to create an entirely beautiful city.

To point the moral, I have only to take our own city as an example. We have more than once heard a city father with pardonable pride refer to this as "no mean city." A no mean city indeed! Whilst that remark points to the many-sidedness of the city's life, its distinguished citizens, its position as a centre of culture and learning, and its great industrial position, it also visualizes the imposing thoroughfares and buildings of which the city may justly boast. Now, take away the work of that far-seeing citizen, Grainger—work that owes its nobility of form to Dobson, his equally great architect—and what remains of our boasted city? How much is there left of the modern city of which one would boast? Yet eighty years have elapsed since Grainger's fine work came into being.

Ross, in his "Views in Newcastle," published in 1841, thus refers to Grainger's improvements: "Our canny toon 'the Coal-hole of the North,' now stands, through his exertions, as proudly pre-eminent for architectural beauty as it has successively done for military glory, for monastic learning and piety, and for mercantile enterprise and respectability. May that enterprise continue to reap and secure the advantages justly its due, while the Tyne shall roll its floods, laden with the products of art and of commerce, to the ocean!" and quotes Milton:

Anon out of the earth a fabric huge
Rose like an exhalation,
Built like a temple, where pilasters round
Were set, and Doric pillars overlaid
With golden architrave; nor did there want
Cornice or frieze, with bossy sculptures graven
. . . .
. . . . The hasty multitude
Admiring entered; and the work some praise,
And some the Architect.

Well have the "enterprise" justified the pious hopes of Ross. The curious thing is that while praise is always forthcoming from those who are responsible for the development of the city, Grainger's brilliant example seems to be without influence in their "enterprises."

Since then city improvements, some on a large scale, have had to be undertaken to meet the growing traffic and business demands; great opportunities have offered themselves to continue the work of Grainger; and a people prosperous enough to bear the burden has not been wanting. With what results? With all our boasting of our fine streets, there has not been. since his (Grainger's) time, one single instance of the many thoroughfare improvements and extensions undertaken having in any way approached in spaciousness and dignity those constructed three-quarters of a century ago, when failure to foresee the enormous growth and nature of the traffic that would crowd our streets might have been considered excusable. Our most recent and most important improvement, offering splendid possibilities for perpetuating the wisdom and foresight of that bygone city-builder of whom we are so proud—and for showing that the future necessities and credit of the city are safe in our hands—has resulted in a complete failure to realize the responsibilities that are placed upon us as an advanced community, and is indeed pitiable. I refer, of course, to the extension of Market street.

Now it must not be inferred that the city is deficient in the intelligence and civic pride and technical and artistic skill necessary to the worthy carrying out of such a project, for there were, and are still, men on the council who realized the possibilities and desired to see them taken advantage of, but who were not strong enough to prevail against the people whose indifference and short-sightedness were reflected by their representatives on the council. It is the people themselves who are responsible, and it is our business and the business of those who are devoting time to the study of better housing and town planning, to foster and encourage an appreciation of the moral and material benefit that will accrue from an improvement in those vital matters of civic life.

But this, as I have said, is laborious in the extreme. Nothing but a cataclysm would have the desired effect. Well, gentlemen, the cataclysm is here, and is in process of working that change in the perception and outlook of the people themselves, from which great things can confidently be looked for. Think what is taking place just now with us: something that has not occurred since the distant past, when people were fierce, migratory, and elementary in their civilization: something that history will record as very wonderful and far-reaching in its results—in fact, something that ushered in as distinctive a period in the life and arts of our nation as any that can be recorded in our history. A whole nation has shaken itself free from the peaceful pursuits and traditions of centuries; its whole manhood that counts is for the first time in its history leaving its shores to stem the threatening flood of barbarism that was descending on it and its peaceful neighbors, is penetrating new worlds, and is coming under the influence of new friends and new conditions undreamt of. Three years ago the imagination would have reeled at the suggestion of half the truth of to-day.

What is it that causes the narrow, parochial, and unimaginative outlook from which the people in their lives and habitations suffer? It is that the majority are tied and fettered to their particular circumscribed world, in ignorance of a wider and nobler existence of thought and action, fostered in the insular belief that Britain leads the way in everything. We know, at any rate so far as the arts are concerned, that to cut ourselves off from contact with other peoples would not give us a leading position. I do not believe that in any phase of life a nation can isolate itself without deterioration. Is not our greatness largely due to the roving, restless spirit of the great pioneers of our race?

By the nature of things, that spirit has not been given play amongst our industrial millions, who are now more responsible than in the past for their own government; hence that narrowness of outlook which is reflected in our towns and cities. But can this wonderful thing that is happening leave things where they were? Can you take millions of men and women—the whole nation in fact—and such a nation, nay, a world-scattered Empire—from the narrow daily round from which few can escape under ordinary conditions, train them to a new existence, where unsuspected traits of character reveal themselves; lead them into foreign countries, which they for the most part would never have known, there to come in contact with peoples of different ways and thoughts not inferior to their own, there to see new cities and new modes of life, that cannot fail to have some message for them; there in fierce contest to defend the right to develop in the way they think best for themselves?—I say, can you do this with the people, those who will one day dictate the policy of our civic life and mould the external appearances of our towns and cities, and expect them to remain unchanged, uninfluenced by the tremendous experiences through which they have passed as never before in our history? It is unthinkable. Remember, it is the whole manhood of the nation, not one class, but every social stratum and grade of which the nation consists, a whole nation's intelligence that is under treatment. It is not even confined to the manhood of the nation; women as never before are playing an heroic part in spheres that hitherto they have not entered, and their influence cannot fail to be very marked in the work of the future. It is so tremendous and overwhelming a thing that is upon us that few have any conception of what it portends. The subject is a vast and interesting one with many phases, but one which I cannot pursue further, and I will conclude these few immature thoughts by recommending those who have the leisure—and who remaining behind in the architectural world has not the leisure?—to devote some consideration to those inevitable changes that will be demanded in the future by the more thoughtful and newly enlightened citizen in every rank of life.

Much, I am sure, will be expected of our profession in the way of interpreting their aspirations and of giving them a worthy, concrete expression; and I am convinced that the hitherto ill-fostered arts will, with a widened intelligence and outlook, take their proper place amongst the higher things that will be desired of life. A people gets no more nor no less than it deserves. Well, I believe our people will deserve better things, and that a higher standard of attainment will be demanded of architects than in the past, and only those of us who are worthy of it may hope for success in that Golden Age to come.

Wood Block Flooring

By J. L. BOYD, C. E.

A SUBJECT of great importance to architects and engineers, in connection with factory construction, is the one of flooring—what kind of surface to put down that will stand heavy service, that will be low in upkeep, that will be easy under foot, etc.—are questions that must be solved by the prospective builder and architect. The success of creosoted block wood paving on streets has been achieved on its merits wherever it has been laid, and just recently it is reported that "The committee on streets of the Seattle Municipal League, after five months of investigation of the merits of various forms of pavements now in common use, and the manner in which these pavements have stood up under actual wear, has recommended that creosoted wood blocks be used for the improvement of the East Marginal Way, a big street improvement project."

WOOD BLOCK FLOOR, GRAND TRUNK SHOPS, STRATFORD, ONT.

It is such evidence and record that has made creosoted wood block so desirable for flooring where heavy trucking, the moving of heavy machinery, or other severe service makes the maintenance of floors a serious problem. It is extensively used for flooring in warehouses, factories, foundries, machine shops (all kinds), railroad shops, roundhouses, railway stations, platforms, wharves, barns, stables, garages, cotton mills, paper mills, rubber plants, hospitals, laundries, printing houses, fire engine stations, etc., in fact, any situation where durability under service is a prime factor.

The creosoted wood block floor is not as universally known in Canada as in the United States, but amongst those who have realized its importance and have laid, or are about to lay such floors, are many of the most prominent mercantile and manufacturing companies in Canada.

The blocks are manufactured in Canada from Canadian Norway pine, which wood resembles very closely in structural qualities and appearance the Baltic pine, used so extensively in England for block purposes. The lumber from which the blocks are made is of selected stock and air seasoned. A sawmill at the treating plant cuts the lumber into blocks of the size specified, which varies in depth from two and one-half inches to four inches, the four-inch block being used for extremely heavy service. The blocks are three inches in width, and from six inches to ten inches in length.

After the blocks have been cut they are delivered by conveyors to cage cars, holding approximately thirty-six square yards of blocks each. When ten of these cars are filled they are transported to the treating cylinder, one hundred and thirty-four inches long and seven feet in diameter, made of steel, and provided with an end door, through which the cars enter the cylinder. The door is then closed and securely held by means of swing bolts, making the cylinder absolutely airtight. The cylinder is then filled, from an overhead tank, with creosote oil, heated to approximately one hundred and eighty degrees F. When the oil ceases to flow into the cylinder a pressure of approximately one hundred pounds to the square inch is applied by means of pumps, and maintained a sufficient length of time to force additional oil into the blocks until they are thoroughly saturated. Pressure is then released and the oil is pumped out of the cylinder. When the cylinder is drained a quick high vacuum is applied to withdraw the surplus oil in the block and leave in the wood the amount of oil specified, which, for interior work, will average eight pounds per cubic foot of wood; for outside paving purposes from fourteen to sixteen pounds of oil per cubic foot is left in the wood. The method described is known as the Lowry process. There are other methods, but all have the same end in view; *i.e.*, to secure a uniform penetration of the preservative oil.

The method of laying the wood block floor is somewhat similar to street paving work, the best results being obtained when a concrete base is used as a foundation, which may be as light as three inches. The thickness of the concrete base, however, will depend upon the nature of sub-soil and the floor loading. In situations where concrete is impracticable a well supported sub-floor of creosoted plank is used. In one large shop the blocks were laid upon a bed of cinders eighteen inches deep, placed in four-inch layers, and well tamped with hand pounders of varying weights, a light sand cushion being placed on top of the cinder bed, upon which the blocks were laid.

WOOD BLOCK FLOOR, GURNEY FOUNDRY, TORONTO.

The concrete surface should be finished smoothly and in true contour to the finished floor. Upon the concrete surface is spread dry a mixture of one cement to four sand, averaging one-half inch in depth, and struck smooth and true to the finished surface, sufficient water being sprinkled over the floor surface after the blocks are laid to set the mixture (in some locations a cushion of sand may be used in place of the cement and sand mixture). The wood blocks are laid upon the cushion with the *grain vertical.*

In situations where the floor will be always dry, the block should be laid tight-jointed, but where the floor will be wet or alternately wet and dry, they should be laid with open joints of about one-sixteenth inch between the sides, and three-sixteenths inch between the ends of blocks, with expansion joints against all walls, machine foundations, etc. The joint spaces are two-thirds filled with an asphaltic or tar filler, which forms an elastic cement around each block, thereby making the floor absolutely watertight, and, at the same time, will allow individual blocks to expand and contract without injury to the surface. The top of the joint spaces above the filler may be filled with clean sand if necessary. A special block is manufactured for wet locations, having ribs or projections down one side and one end; the ribs may be made in any width and thickness, which, tapering to an edge, allow of equal spacing when laying, and will compress under expansion of the block.

Among the essential qualities of creosoted wood block floors might be mentioned, durability, low maintenance cost, smoothness, adaptability and comfort.

Its chief advantage is durability under service, by laying the block with the grain vertical; there is no perceptible wear after years of service, as the wood fibres compress somewhat under traffic, and form a matted, resilient surface, which does not wear off. There is no such thing as wear or splintering, as there is on a plank floor; neither is there any scaling, chipping or fracturing as on a hard, non-resilient surface. The impregnation of creosote oil will prevent the blocks from decay.

The record made with creosoted wood blocks used for street pavements will apply to floors also. To cite one street in Minneapolis, where thirteen thousand five hundred square yards were laid in 1902, under heavy traffic, up to 1915 the total repairs amounted to 0.1 cent per square yard, or less than fourteen dollars for thirteen years' service. Creosoted wood block floors can readily be taken up and re-laid for repairs to pipes, etc., under the floor, or for the installation or renewal of machinery, without injury to the block. On account of the manner in which the block is laid and its uniform surface, trucking is accomplished with ease. There are no ruts or depressions to break trucks; the loads are not thrown off from jars; but a truck can be loaded and handled to its capacity with no breakages. Creosoted block floors have the advantage of being adapted to practically any shop conditions, whether wet or dry, heavy or light service. There is no dus tto injure delicate machinery, and the floor is practically noiseless. Articles in the process of manufacture accidentally dropped are not injured—any intelligent laborer can lay the block. If anyone were asked what floor he would prefer to walk over or work upon for any length of time, wood block would be the selection. It is sanitary, easy under foot, warm in winter, and gives sure footing. Plant efficiency can be maintained only where the workman's comfort is considered, and cannot be had when men are compelled to work on cold, hard, uneven floors.

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What Are Acoustics ?

If closely questioned upon this point, many architects, if equally frank, might with the same truth make a reply similar to that credited to the eminent Richard M. Hunt of New York, one of the greatest architects America has produced, in the following incident:

It was the custom of Mr. Hunt to make charcoal studies of interior details, full size, and for this purpose had prepared in a room of the New York State Capitol, where he was engaged, a long wall space with a running board from which to work. On this particular morning Mr. Hunt, clad in a long linen duster to protect his clothes from the charcoal, was busily employed upon some details, when by some means entrance was obtained to his room without his knowledge, and the following dialogue ensued:

A Voice—"Is this Mr. Hunt?"

Mr. Hunt, continuing his work without looking around—"Yes, I am Mr. Hunt; what can I do for you?"

The Voice—"Well, Mr. Hunt, what do you know about acoustics?"

Mr. Hunt, still absorbed in his work—"I guess I know as much as anyone, and that's d——d little."

The Voice—"Well, Mr. Hunt, I think you are the man I am looking for. I wish to build a large church, and I am looking for an architect who will acknowledge he knows nothing about acoustics. My name is Henry Ward Beecher."

However, the increasing use of reinforced concrete and similar non-absorbent materials in construction during recent years has resulted in so many auditoriums with defective hearing conditions that the subject of acoustics is at present of vital interest to everyone concerned in the erection of public buildings intended to provide accommodations for the gathering of audiences of any size or nature.

Particularly timely, therefore, is the issue of an "Essay on Architectural Acoustics," prepared by Mr. J. R. Crowley, president and acoustical engineer of the United States Acoustical Correction Co., 6 Beacon Street, Boston, Mass., and published by that corporation.

Quoting briefly from this "Essay":

"The acoustics of an auditorium are its conditions for hearing speech and music. When we say a room has faulty acoustics, we mean the conditions for hearing speech and music are bad.

"In the design of buildings it is a natural tendency of architects and the desire of their clients to pay greatest attention to beauty of design and stability of construction, which under the most approved ideas in the past often result in the failure of acoustic properties. Where the room is necessarily large, it is practically impossible to secure satisfaction without special construction.

"Bad acoustics are chiefly due to excess reverberations and echoes, caused by sound waves continuing in the room for several seconds after the source of sound has ceased. Briefly, this is due to the fact that sound travels from the source such as a speaker spreading out spherically in all directions, the angle of incident being equal to the angle of decadence, and is reflected to and fro from one wall to another and gradually soaring and constantly diminishing in intensity—according to the greater or less absorbing power of the exposed surfaces—until the energy is entirely expended.

"In a room or auditorium having faulty acoustics, we must absorb these sound waves as they strike the different barriers and prevent excessive reverberation being reflected upon the audience.

"By scientific experiments it has been determined that every known material used in the construction of the inside of an auditorium or room has a certain co-efficient of sound energy absorption.

"From these co-efficients it is very easy to determine the total units of absorption of the material within the room. After the total units of absorption are found and the volume of the room in cubic meters, one can determine accurately the duration of the residual sound, that is the length of time the atmospheric vibrations continue in a room after the source of sound has ceased.

"Now it has been determined that in order to have proper acoustic properties within a room we must have a limit to the duration of the residual sound. In a room used for speaking it should not be more than 1.5 seconds. In a room for music, not over 2 seconds. Therefore, if a room has a duration of residual sound exceeding this time, the room has faulty acoustics, and it is very certain that the excess reverberations must cause confusion in some part or parts of such room.

"The problem to solve is how to kill this excess reverberation (muffle or absorb the excess residual sound).

CONSTRUCTION

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FRASER S. KEITH - - - EDITOR AND MANAGER

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An Industrial Year

The year 1917 has every indication of being the greatest in the industrial history of the Dominion. Evidences are not lacking which prove this to be the case. At the present moment practically every factory in this country is working to capacity whether it be devoted to manufacture of war products or those of peaceful industry. Many firms have contracts at hand which will keep their entire staffs employed throughout the year. There has been promised, if the people of Canada do their share towards helping to finance such, an additional volume of war contracts aggregating five hundred millions. A feeling of optimism prevails that goes beyond the filling of mere war orders, into days of peace that it is believed will prevail a year hence. The part that Canada has played in the world's war, and the readiness with which her manufacturers arose to the situation in supplying the Empire with needed materials, have given her industries a place in world affairs that under ordinary conditions would not have been accomplished in half a century. There is a strong feeling at present in the United States that when war orders cease, the industries of that country will experience a relapse unknown in the whole of their history. There is, further, a feeling almost of envy on the part of American manufacturers regarding the industrial outlook of Canada. This feeling is stronger to-day than it ever has been in the past. Its outcome will be that a greater number of industrial concerns in the United States will establish factories in Canada in the near future than at any time previously.

Up to 1914 United States investments in branch plants in Canada represented an outlay of one hundred and fifty million dollars, and was the largest single item at that time in the list of their investments here, which totalled nine hundred and seventy-eight million dollars. Since the war commenced, investments in Canadian securities have brought this item to a greater aggregate than the amount invested in industries. During the past two years fifty United States companies have erected factories and commenced operations in this country, making a total of about five hundred. A large number of these are controlled in Canada with Canadian directors, but for the most part they are under the direction of the parent companies.

As an indication of the impetus that industry has experienced in Canada during 1916, the situation in Hamilton is of interest. A total of seventy-two new factories or additions were erected there last year. While a good many of these new pieces of construction were the outcome of war industry, a large number were due to expansion in business, the result of domestic trade. In Toronto, the total number is not available, but factory construction represented a fairly large share of the total building permits. There were completed, or under construction, during 1916 factory buildings representing an investment of several million dollars. In Guelph, which has always been considered a conservative city, seven new industries commenced operations. Windsor, Lindsay, Trenton, Welland, Port Colborne, Sarnia, Brantford, and many others, particularly the newer towns in Northern Ontario, have all shared in increased factory construction. Canada's position as a manufacturing country is established. The forward movement is under way.

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Eliminating Dishonest Practice

When one man or a few men so conduct their affairs that an odium is cast upon an entire profession, then the members of their profession owe it to themselves to eliminate from their association, and without ceremony, such party or parties. Quite recently a manufacturer remarked to the writer that he thought architects were a crooked lot, which led to an indignant protest against such a statement, and a request for proof that would substantiate it. In the ensuing conversation it transpired that he based his remark on *one single experience* he had had with an architect from Western Ontario, who came with a client, selected some equipment for a building in course of erection, and asked for an extra discount from the prices quoted. "Perhaps," we suggested, "he was working solely in the interests of his client and had no personal motive whatever." To which he replied that he was sure he had. Questioned further, our friend the manufacturer could not remember another single instance in his relations with Canadian architects upon which he could base the charge he originally made, although he said he could recall many in his dealings with United States architects, thereby admitting that he was condemning a whole profession in this country by the impression he received from one man, which was not only illogical, but grossly unfair.

Every profession has its unprofessionals. Such has been the case throughout history, and will be as long as there are men whose sordid selfishness and greed are more impelling than, and outweigh, their obligation to their chosen calling. When a doctor, a lawyer or a minister is accused of unprofessional conduct his case is taken up by the men of his own profession, and if found guilty he is debarred from practising it. If an architect or engineer is known to resort to questionable practices, apart from an occasional disparaging word against him, no action is taken in his case, the reason being that there is no authority to do so.

The canons of the American Institute of Architects contain the following definition as to what constitutes unprofessional conduct. "It is unprofessional for an architect to accept any commission or substantial service from a contractor, or from any interested party other than the owner."

"It is unprofessional for an architect to injure falsely or maliciously, directly or indirectly, the professional reputation, prospects or business of a fellow-architect," and

"To attempt to supplant a fellow-architect after definite steps have been taken towards his employment, *e.g.*, by submitting sketches for a project for which another architect has been authorized to submit sketches."

These are more tersely put in the canons of professional ethics adopted by the Illinois Society of Architects:

"To accept any commission or any substantial service or favor from a contractor, or anyone connected with the building trades.

"To injure intentionally the fair reputation, prospects or business of another architect.

"To attempt to supplant a fellow-architect after definite steps have been taken toward his employment."

This practically constitutes what is considered a professional crime on the part of any architect throughout the world. It must be admitted that there are men practising architecture who are constantly resorting to such tactics. Are the members of the architectural profession in Canada going to sit quietly by and allow a few men to besmirch the entire profession? This raises the point as to how such men may be eliminated; and the answer is, never, as long as the architects of Canada are content to submit to present conditions in respect to their limited powers concerning their own affairs.

That there is an absolute need of a licensing or registration law in Canada is the opinion of a great majority of architects and engineers in this country. A few years ago the Canadian Society of Civil Engineers applied for legislation at Ottawa, but failed because they were trying to make it too drastic, giving the Society greater power than was deemed expedient. In the name of all that is reasonable, and in the interests of ordinary justice, both the engineers and the architects should have it in their own hands to regulate the affairs of their professions to a greater extent than at present. Take the case, for instance, of eliminating the undesirable. No reasonable legislature will refuse to grant authority to do this when it is coupled with a properly designed scheme of licensing and registration. Now, when the Canadian Society of Civil Engineers has approached the Government with a view to giving Canadian engineers the recognition they deserve at the hands of the Government, and in view of the feeling of protest on the part of our architects being discriminated against in favor of outsiders, there is a splendid opportunity for hand-in-hand co-operation, which, if followed through in the proper spirit, will undoubtedly lead to a more desirable state of affairs.

Civil Engineers' Meeting

The annual meeting of the Canadian Society of Civil Engineers, which will be held in Montreal on the 23rd, 24th, and 25th of January, promises to be one of unusual interest and one of the most important in the history of the Society's affairs. During the past year, the council of the Society formed a committee on Society affairs composed of members from the seven districts, with Mr. H. E. Haultain as chairman, and Mr. E. W. Oliver, secretary. This committee, which has carried on its work systematically during the year, and in which it has endeavored to secure the co-operation of the entire membership, has brought forward a number of recommendations, some of which will have an important bearing upon the future of the Society. They are as follows:

1st.—The inclusion in the List of Members of a geographical distribution by Districts.

2nd.—The creation of a new classification in membership to be known as "Retired Members," in which the annual fee will be nominal, for those members over sixty-five years of age who have been Corporate Members of the Society for over twenty years, and who desire to be so classified.

3rd.—The publication of a journal or periodical at least once a month, devoted largely or entirely to the interests of the Society and its members.

4th.—The elimination of interest charges on annual dues for the first six months of the current year, a fixed charge of 50 cents being made for each period of six months thereafter during which the fees remain unpaid.

5th.—Systematic publicity in the public press.

6th.—A systematic effort to have recognized university engineering professors identified with the Society and to secure the co-operation of such universities.

7th.—The engagement as soon as practicable of a Secretary who will devote his whole time to the Society.

8th.—The election of the Nominating Committee and of the Councillors by the Districts.

9th.—The encouragement of the general use of the Society's Standard Specifications by the membership and by municipalities.

10th.—The change of name from Canadian Society of Civil Engineers to "The Canadian Institution of Civil Engineers."

11th.—The re-drafting of the entire by-laws.

12th. The systematic collection and filing in the library of important engineering reports in Canada, Great Britain, France and the United States.

13th.—The appointment of a Committee to be known as, say, "The Public Service Committee" whose duty it shall be to take cognizance of and report upon any or all public questions or legislation which may appear to be contrary to sound engineering practice or to the interests of our membership.

14th.—The obtaining of annual grants from the Dominion and Provincial Governments.

Another question that might be discussed to advantage with a view to action being taken thereon, is that of closer co-operation between the engineer and architect. In an article published in these pages in May, 1916, by Mr. G. R. G. Konway, an able discussion was given pointing out the important relationship existing between architects and engineers and indicating points of contact where co-operation was advantageous to both professions. The annual meeting should provide an opportunity of an open discussion on this subject.

There has been great interest on the part of the members taken in the affairs of the Society during the past year, which will no doubt result in a record attendance at the annual meeting in Montreal.

The following circular has been issued by the secretary to the members of the Society referring to a situation which attracted the attention of every member of the Society. This circular is self-explanatory and follows:

To the Corporate Members
of the Canadian Society of Civil Engineers.

I am instructed to inform you that the circular issued on September 7th, 1916, by the Council, regarding the principle of the employment of non-Canadian engineers by the Government, has received considerable attention at the hands of the membership, and that as a consequence much information has been forwarded for the use of the Council. Sir Henry Drayton also took note of the circular and addressed a communication to the Premier in regard thereto.

The Council at many regular and special meetings, as well as through specially appointed committees, has given most careful consideration to all the representations that have been made by the members, and to the communication by Sir Henry Drayton above referred to. The consensus of opinion in the Council is that much benefit will result to the profession and to the Society from the steps that have already been taken, and that it does not seem necessary to take any further official action at the present time. The whole subject is still before the Council which will continue its interest therein, and a discussion has been opened up with other representative bodies.

The Council has instructed me to say, however, that in its opinion it is necessary and desirable that the members should continue to interest themselves in upholding the principle of the employment of Canadian engineers by the Canadian Government.

C. H. McLEOD,
Secretary.

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Preparing For The Future

Great Britain is setting us a splendid example towards preparation for conditions that will arise from the great war. The steps already taken by her leaders to secure the greatest national efficiency, stand out in bold relief as a beacon light beckoning us to follow. While every thinking man in Canada is convinced that we must strain every effort to hold the position we have gained, with the exception of a trade conference being outlined, but not yet accomplished, we are doing practically nothing in the way of preparation.

A new department of scientific research has been established in England under royal charter having a permanent secretary. This new Government scheme embodies: A large grant, estimated to cover the next five years; exemption from taxation of money set apart by firms for research; special grants to local authorities to provide improved training of technical teachers and technical scholarships to the universities; an annual grant for helping approved individual research workers, professional societies, and research work generally of a nonprofitable nature for the time being; a series of researches under the coal conservation committee to introduce economy in the use of fuel.

This is only one direction in which thought is being taken for the morrow in Great Britain, and should be an incentive to the Dominions to awake to the fact that immediate action is necessary along the same line.

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Manufacturers' Catalogues

There are many catalogues and booklets issued by manufacturers which, from their attractiveness, the amount of technical knowledge displayed, and the real information contained, deserve more than a passing glance on the part of architects and engineers. They are often the result of a life-time's study on the part of one man or a group of men, generally contain explanatory illustrations, and while necessarily written from the manufacturers' viewpoint, are nevertheless sources of valuable information.

A few years ago there was so much trade literature arriving in the mails of the architectural and engineering professions that it was impossible to give them proper attention. The tendency at present seems to be to embody a fund of real information, and as such a study of the pages of the catalogues now being issued by many manufacturers is time well spent.

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The National Complete Building Exposition

This exposition is to be held in the Grand Central Palace, New York, March 5-11, this year. It will be a furtherance of the movement for better building, which was initiated in the first American complete building show, held in Cleveland, O., last February. The effect of the Cleveland show has been felt. Expanding beyond a mere exhibition of all kinds of building materials and equipment, the exposition will provide instructive demonstrations of architecture, construction methods, engineering, landscaping and garden furnishment. Special divisions will be devoted to factory, commercial and general building; there will be separate displays of theatre, church and school building equipment; and the home building interest will be maintained with equal strength.

Architectural Digest

Articles of More Than Passing Interest From Our Contemporaries

THE RELATIONS BETWEEN THE ARCHITECT AND THE MASTER STEAM FITTER.

By D. Knickerbacker Boyd.

In the matter of direct letting of contracts, I have read all the literature on the subject, including your own "Report on the Evils of Sub-contracting." I can subscribe to the principal objections which you raise because I know that these evils have existed, but you must not condemn all general contractors. And, after all, what you are aiming to change, it seems to me, is not so much the sub-contracting evil as the sub-estimating principle.

I personally feel that too much stress has been laid on the sub-contracting evil without due regard to any perfectly feasible plan of controlling the estimating. Perhaps you have found this method the means of most quickly checking an abuse rather than the slower process of education.

All branches of the building trades have suffered alike from the "farming" and "huckstering" of sub-estimates and dickering with sub-contractors which is practised by some, but by no means all, general contractors. Sub-contractors who allow themselves to take part in this are equally at fault.

When work is awarded under one general contract, architects can help all the trades and very largely control the whole situation by requiring that a complete list of all sub-contractors be submitted with the estimate, the same to be subject to the approval of the architect and not to be changed without consent after the contract is awarded.

In my own practice we invariably do this, to protect all interests and insure a selection of capable men. But in the case of heating we practically always take the estimates direct, and, whenever possible, do the same with plumbing. We turn over the lowest of these to the general contractors, who estimate with the understanding that they must accept them as sub-contractors' bids if they want the contract.

This gives us the opportunity to carefully select the bidders—a most important consideration. Only the men we deem best qualified to do work of the kind and size in hand are asked, and the number limited to from three to five. This is quite sufficient. Others should not importune for the privilege and so lessen their prestige. Architects should be resolute and not allow any one to estimate who does not do the high grade of work as those selected. This will save disappointments and insure to all an equal chance on the basis of good work. Under these favorable conditions the lowest figure should prevail in the award. Under general and open competitive bidding the low estimate is often to be regarded with suspicion.

In selecting those to whom they will entrust the work, architects ought to inquire and know whether they have the respect and confidence of their associates, as well as whether they are members of their respective associations. In this way architects can help to control the situation and you can co-operate with them in many ways.

In some of the States where the separate contract law obtains, annoyance is often caused because the heating, plumbing and electrical work cannot when desired be incorporated in the general contract for State and municipal buildings. If all the contracts were separately let, and there were no general contractor, the situation would be quite different. So would it be if, after securing separate estimates on the mechanical equipment, in the manner I have indicated, the contractors for these branches of the work, upon approval as to their fitness, could become sub-contractors to the general contractor. While this would cost the owner more, it would insure a unified responsibility for the completion and term maintenance of the building, and would simplify the course of procedure throughout the work. Under the existing conditions contractors are often working at variance and the way is open for constant dispute and discussion as to interference, delay, responsibility for damage and defects.

How to Obviate Losses Due to Estimating as Sub-Contractors.

The contention made by your committee that estimating as sub-contractors to all general contractors involves a loss to the trade is well founded, and worthy of every consideration. The difficulty would, however, be obviated if architects were required to take separate estimates just as at present, under the law referred to, but could have the option of incorporating these into the general contract under proper conditions. Your interest would be fully protected in work of this nature if the general contractor were required to furnish a bond protecting sub-contractors, as, for instance, is required on all municipal work in the city of Philadelphia, and owners and architects would be saved much annoyance and duplication of duties, clerical and supervisory.

The Situation with Reference to the "Standard Documents."

The matter of improving the relations between architects and those entrusted with the execution of their work by no means ceased to engage the attention of architects with the discontinuance of the Institute's conference committee. Work was still under way by another and larger committee of the Institute of Architects to bring about better conditions in all estimating and contractural relations in which architects, owners, contractors and others are vitally concerned.

I refer to the committee on contracts and specifications, which finally concluded its most arduous labors little more than a year ago, when, after serious and countless conferences with representatives of the National Association of Builders', exchanges and many other interested bodies, the second edition of the "Standard Documents of the Institute" was issued.

These embrace four papers: "Form of Agreement and General Conditions of the Contract," "Bond of Suretyship," "Form of Sub-Contract," "Letter of Acceptance of Sub-Contractor's Proposal." They cover as fully as is possible the points formerly raised as to the relations of the architect to all parties in interest and the relations of these parties one to the other, including all contractors, sub-contractors and the owner.

Desiring to fortify my position on this occasion with the views of other architects, I wrote several of my friends in different cities, asking for suggestions.

Among the replies received was one from W. Stanley Parker, of Boston, whose great service in connection with the work of the committee to which I have just referred, to the profession of architecture, and all interests allied with it, has everywhere been recognized.

Attitude of New York Contractors Toward "Standard Documents."

The letter has such an important bearing on our relations that I am going to read it to you, and I earnestly hope that it may result in furthering your co-operation. He said:

"Roughly, the situation is this: The men in New York who are members of the National Association are also members of the Building Trades Employers' Association in New York. The committee of the Employers' Association has not approved the documents, and some of the steam fitters in New York seem to agree with objections that the New York Employers' Association have made. The National Association of Master Steam Fitters, however, prior to this action in New York, did approve the documents. An effort has been made to get the National association to withdraw its approval, but this action has not been taken. The National association, however, did fail to approve the revised subcontract form on account of the general situation. I have been all over the situation with one of the men in New York who, though not on the committee there, has voiced, as I understand it, the general points of opposition that they find.

"The principle objection seems to be that the documents are too long. They seem to fail to appreciate that the value of a standard document is not in its brevity, but its inclusiveness in regard to all of the most general conditions existing in a contract. They seem to feel it is a detriment to have some conditions included which rarely, if ever, occur in their particular work. The fact that the meaning of the standard clauses can be made clear by expert advice, and that they can readily learn what clauses apply to them and what do not, does not seem to appeal to them as being vastly superior to varying general conditions in which they must study, each time, the particular clauses and in regard to which they really should have expert advice of a lawyer each time.

"They also object to the liability insurance arrangement, but apparently because it costs the owner more. All we want and all we were trying to get was complete protection for the owner at the least expense. If we have not succeeded in doing this, subsequent editions will doubtless change the wording. But additional expense to the owner is no justification for refusal to approve the documents.

"They also seem to think that the documents are available for application only to general contracts. They fail to see the intended and actual adaptability of the documents to any contract, and a heating contract practically always has subcontracts involved in it, and so is in effect a general contract itself; the form, therefore, applies to their work as direct contractors, if their work is so executed. Doubtless in connection with a heating contract, or electric contract, or a plumbing contract, additional clauses would be needed, as in the case of nearly every building contract, and conceivably some clauses might be entirely crossed out. The fundamental provisions, however, apply. This they do not seem to appreciate.

"They object to what they conceive to be some statements that limit the architects in being the agent of the owner, and feel, apparently, that all provisions of the contract in which the architect is assumed definitely or by inference not to be the agent of the owner are objectionable. They fail to appreciate that for the purpose of carrying on the contract as agreed upon, the architect is definitely accredited the agent of the owner for certain specific purposes, but that for purposes of changing the contract his agency is properly limited, as every owner would naturally insist.

"There also seems to be objection to the fact that it is possible to make changes in the Standard Form, and that changes are even anticipated. They seem to feel that if a Standard Form can be changed it loses its value as a Standard Form. This, of course, appears on the face of it, to us, to be unreasonable, since no standard form will ever be developed that will not be subject to changes to fit individual conditions. Having, however, a complete and full Standard Form, it assists the contractor to observe readily points in which changes are made, the balance of the document being familiar to him without study in each particular case."

Contractors Should Not Pay for Blue-Prints in Estimating.

I feel that it is quite right and only proper that, except in the case perhaps of advertised work, contractors should not be required to pay for blue-prints for estimating purposes. Heating contractors should also retain one set for their files and records. They are doing their full share in bearing the cost of estimating, which under our present system is but a contribution to our enormous national waste and a factor in the high cost of building. It has been computed that there is spent in this country each year for the privilege of estimating the sum of over $85,000,000, more than one-half of which, on a conservative basis, could be saved if efficient methods along the lines of the so-termed "quantity survey system" were generally adopted.

Instead of hopefully waiting for proper methods of estimating to be evolved, let us do our share now in improving them in every way possible. Architects can help greatly in conserving waste of money and human energy in the heating field alone if they will do some very simple things, which I suggest that you can call upon them to do. Some of these are now being done by those architects whose first thought is real service to their employers—the clients. One of these is the preparation of clear and complete drawings and precise specifications which lessen the time and risks contractors take in estimating and which convey to them the assurance that they will not, if they secure the contract, be expected to make up for shortcomings of the architect.

I have seen some architects' drawings without figures outside or inside of the plans, and have read some specifications almost as brief as this: "Heat all portions of the building to 70 degrees in zero weather and guarantee these results." Here we have steam-fitters, say twenty to thirty, if under the subcontractor evil, spending their time scaling off every office or room or enclosed area, when all this time could be saved if one draftsman in an architect's office had taken the time necessary to do this work once—and properly.

In that large number of every-day cases where no consulting engineer is employed, and where you are expected to do your own calculating and engineering, and assume all responsibility for results—only to be beaten out, if you have figured even conservatively, by some one not so scrupulous, intelligent or careful—why not refuse to estimate until you are furnished with a reasonable amount of data upon which to base your estimate?

I would urge you, individually and collectively, assuming that you are willing to estimate under these conditions, to insist upon certain basic requirements as a precedent to estimating. Architects can help you greatly if they will become accustomed to putting on every plan both dimensions of each enclosed space—perhaps even to computing either the area or the cubical contents of each enclosure—moreover the addition of figures to indicate the area of window and outside door openings would in many cases save much time and handling of prints to refer back and forth from plans to elevations and sections. Can you not take this up and perhaps consider symbols for drawings?

And in the matter of incomplete and indefinite specifications or of those equally as bad, imposing conditions or guarantees impossible to provide—even if they have been prepared merely in accordance with the routine of an antiquated custom—why not return them to the architect or the engineer responsible for them and frankly state your reasons for not estimating? Be courageous and do this for the good of the cause!

Obviously the architect who makes every heating contractor perform gratuitous calculating and engineering saves himself time, labor and cost, and transfers those not to one but to a large number of heating contractors—and, eventually, to the owners.

And yet one of the singular factors in this condition of affairs is that the trouble often begins with the owners, who too often do not select their architects on the basis of competency and integrity. After allowing for the young and inexperienced men who are selected on the basis of friendship or otherwise and should be given every practical assistance possible by associations of their fellows and of others in the crafts the facts are that many architects who render full and proper services are the ones who charge a greater fee than those who do not, or rather, I should say, those who do not render or do not expect to render the nicer and fairer and, in the end, the more economical service, do not charge the owner as much as those architects who do. Unfortunately some owners give too much consideration to the question of fee in selecting their architects and do not always discriminate between the kinds of service, where the recollection of the quality will remain long after the fee is forgotten. You heating men have the same thing to contend with, so you know all about it, but the owners do not discover their mistake until it is too late.

Of course, for all work of any size, for power plants, and mechanical equipment and for work of a specialized nature, it is to be presumed that the services of a competent engineer have been engaged and the drawings and specifications prepared with accuracy and precision. Presumably such a man will be a member of The American Society of Heating and Ventilating Engineers. If not, he ought to be.

Value of High-grade Membership for Reference Purposes.

In passing I wish to lay stress on this matter of membership, for it applies to your own association as well. All the good men in your calling should invariably be included in your membership. Only such should be properly qualified to enjoy the privilege of your association. Then it will be pertinent on the part of architects and owners considering the awarding of a contract to inquire if the contractor about to be chosen is a member of the association, and if not, why not? Not being a member should be attributed either to a lack of eligibility or to a lack of sensitiveness to his responsibilities, for all good men should delight in assisting organizations of their fellow craftsmen, not for what good the association may do them, but for what good they may do the association.

Your association through its members and committees has already done much to simplify heating practice. This ought greatly to be appreciated by the trade in general, especially by the younger men, who have thus benefited by the results of your experience. You have in this way, also, rendered an assistance to architects and performed services to the owners and occupants of buildings perhaps unknown to them.

In addition to what you have done in perfecting certain practices in piping, and in standardizing flanges, couplings, and threads, etc., can you not further co-operate with The American Society of Heating and Ventilating Engineers and with The American Society of Mechanical Engineers and manufacturers of apparatus, in developing a standard or uniform basis of rating for boilers and domestic water heating apparatus, etc.? I know you have been working on this, or I have read of it in your 1914 proceedings, but can we not look for a definite pronouncement and the publishing of the results?

Uniform Radiation Formula Recommended.

Can you not in co-operation with the same society work on developing a basic formula or officially approving one of those in existence for computing the amount of radiation recommended in proportion to cubical contents, to outside wall area (for different kinds of walls) and different exposures, to window and door openings, etc., and make this available to all architects for instant reference?

Such a formula, if not actually used, as it should be, by those architects who do not employ an engineer for some of their everyday problems, could at least be referred to in their specifications. Then, instead of calling for the building to be heated according to the varying individual judgment of each contractor estimating, these architects could refer to such a formula, as providing the minimum installation allowed. This would undoubtedly be a great improvement over the indefinite methods now obtaining and would provide equable conditions of estimating so far as capacity of apparatus and amount of radiation is concerned. If any estimate received appeared either too low in cost or deficient in quantities, such a formula would afford any architect an opportunity to check up for comparison with other estimates.

Of course, preferably, it should be used as the basis of his own calculations to be definitely stated before estimates are asked, and, if so used, I cannot see how it would interfere with the occupation of heating engineers, which is one of the arguments that might be advanced against it. Presumably it would only be used by those architects who would not in any case have employed an engineer for that particular work.

This is a suggestion which I wish you seriously to consider, for I believe it would greatly facilitate common practice in steam fitting, just as the piping of buildings for gas will be facilitated by the basic piping schedule recently adopted by the National Commercial Gas Association.

Of course this basic formula would not alone be sufficient to insure absolute equality of conditions in estimating. There are other matters to be considered, such as a general description or outline specifications or requirements for the ordinary run of work, which, it seems to me, could well be drawn up by your association. This would, of course, not apply to sizes of pipes, which in your case I appreciate are variable, but should be in the form of suggestions to architects as a basis for their specifications to provide truly competitive conditions of estimating, as to whether pipes are to be exposed or to be encased in walls or partitions, as to chasing and covering of same, as to valving and draining raisers in hot water installations, the height of radiators, whether under sills, or seats or not, and so forth, in simple work and on up into air lines, returns and other important principles in larger work.

And there is the matter of sectional covering and banding on lateral runs, plastic covering on flanges, couplings and fittings, and on the heating apparatus itself—surely some standards of practice could be developed which would greatly aid in establishing a uniform basis of estimating.

Use of Names and Brands in Specifications Favored.

While we are speaking on the subject of clarity, why not let us co-operate to get rid of words in specifications which say, but do not mean, "very best quality" and the "or equal," in favor of calling for the brands, thickness and weight of pipes and for the various other products by the several names which will be acceptable?

More and more frequently a distinction is being made as to quality in materials of building construction, and stronger encouragement is being given to those producers who, in spite of rigid competition, adhere to their standards of manufacture and make names for themselves under established brands.

(From an address before the National Association of Master Steam and Hot Water Fitters.)

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PROMINENT MANUFACTURER DEAD.

The death occurred on January 8th of Mr. Hugh McCulloch, President of the Goldie & McCulloch Co., Limited, of Galt, Ont., and Vice-President of the Galt Malleable Iron Co., Limited, and of the Galt Art Metal Co., Limited, and a director of the Gore Mutual Fire Insurance Co. The late Mr. McCulloch was in his sixty-first year, a native of Galt, and closely identified with the industrial progress of the city. He was educated at Whitby Grammar School and Upper Canada College. He was a Conservative and a Presbyterian. He is survived by one brother, R. O., of Galt, and one sister, Mrs. Charles A. Shearson, Toronto.

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PLAN BIG ENGINEERING FEAT.

The Ontario Hydro-Electric Commission will undertake a huge engineering feat in the construction of the proposed Hydro power canal between Chippewa Creek and Queenston. The project is estimated to cost about $9,000,000, and when completed will provide an additional 200,000 horse-power for the use of the manufacturers and citizens of Ontario. The Commission will undertake this work itself and will spend approximately $1,000,000 in the purchase of materials and equipment. As far as possible electrical machinery will be purchased, as the Commission does not want to depend on power generated through the medium of coal.

This greatest of all Hydro-Electric enterprises has been undertaken after two years of exhaustive investigation by the Commission's engineers, and after contractors on the Welland Canal had refused to tender unless they were allowed compensation for the probable advance of coal, and a commission of 25 per cent of the actual cost.

The Commission and its engineers are to be commended for their decision in deciding to tackle this huge engineering enterprise, which we hope will work out successfully and prove to be a good precedent for the construction of all public works throughout Canada. The new canal, when completed, will be twelve miles in length.

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ELECTRIC LIGHT ON THE FARM.

The Hydro-Electric Power Commission of Ontario, in its seventh annual report, gives some interesting data on the advantages and cost of installation of electric lighting in farm homes and outbuildings. The report says: "The farmers in the districts that are being served greatly appreciate the improved condition on their places by reason of having electric light in the house, barn, drive shed and yard. With previous forms of lighting the dull appearance of the place from the road and from the yard had a depressing effect. The attractive contrast that is the result of installing electric light will probably be beneficial in keeping the young people on the farm. The decrease of fire risk on the premises due to the absence of coal oil lanterns and lamps is another feature that is usually considered by the farmer in arriving at a conclusion regarding the installation of electric service on his premises.

"Installations in barns are now being made in conduit, as this method is found necessary for the protection of the wires and fittings. The cost of installation varies according to conditions in the different districts. The open wiring varies from $1.25 to $1.75 per outlet and the concealed wiring from $1.50 to $2.25 per outlet. Conduit installations in the open, that is, in barns and farm buildings, vary from $3.25 to $4.50 per outlet. The outlet in each case is the opening for either fixture or switch; it does not include (except where drop cord is used) the fixture, but does include the switches."

CONSTRUCTION NEWS

Information of Special Interest to Architects, Contractors, and Manufacturers.
Construction Building Reports will Give You Up-to-date Information Every
Day on all New Buildings About to be Erected or in Course of Erection.

BUSINESS BUILDINGS.

Ottawa, Ont.—The Trussed Concrete Steel Company of Canada, Limited, 23 Jordan St., Toronto, have been awarded the reinforced steel contract on an office building for the Dominion Loose Leaf Company, Wellington St., to cost $30,000; The Atlantic Terra Cotta, New York City, have been awarded the terra cotta contract; Hooper Brothers, Elgin and Isabella Sts., have been awarded the cut stone contract; The Italian Mosaic and Marble Company, Toronto, have been awarded the terrazzo contract; Duford, Limited, Ottawa, have been awarded the painting and glazing contracts; McCullum Electric Company, Ottawa, have been awarded the electrical wiring contract; McFarlane & Douglas, Ottawa, have been awarded the roofing contract; A. Gauthier & Company, Ottawa, have been awarded the plumbing contract: Doran & Devlin, 104 Sparks St., are the general contractors; Richards & Abra, Booth Building, Sparks St., are the architects.

Port Arthur, Ont.—The General Realty Corporation Company contemplates the erection of a business block, to cost $60,000.

Renfrew, Ont.—Architect B. Evan Parry, Renfrew, has prepared plans for a business block for the Jamieson Meat Co., Ltd., to cost $15,000.

Windsor, Ont.—Architects Watt & Blackwell, Bank of Toronto Chambers, London, have prepared plans for an office building for the Huron & Erie Mortgage Company, London, to cost $50,000.

CIVIL ENGINEERING.

Hamilton, Ont.—The City of Hamilton contemplates the erection of a concrete subway, to cost $8,000; E. R. Gray, City Hall, architect.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Byron, Ont.—Hyatt Brothers, 289 Egerton St., London, has been awarded the general contract for the erection of a hospital for the London Health Association, to cost $75,000; Watt & Blackwell, London, are the architects.

Hamilton, Ont.—The City of Hamilton contemplates the erection of an addition to the nurses' home Mountain Park Ave., to cost $11,000: T. H. Pratt, 20 James St. North, is chairman for the hospital board. The Board of Control has postponed this project until a later date. Tenders for heating, plumbing and wiring are being called for by Charlton & Co., Clyde Block Building, for the sanitarium building for the Hamilton Health Association, to cost $50,000.

Kingston. Ont.—The Arts Building of Queen's University and upper storey of Court House will be altered and converted to accommodate 1,000 beds for the soldiers; Captain W. S. Symons, 22 Victoria St., Ottawa, is the architect.

Montreal, Que.—The Military Hospital Commission, Drummond Building, will erect a hospital on Drummond St., St. George Ward, to cost $10,000. Jacobs & Bell, St. Catherine St. West, will erect a theatre on Grey and Bulmer Sts., to cost $59,000.

Toronto, Ont.—The Salvation Army will make alterations to their Training College on Sherbourne St. for hospital purposes, to cost $7,000. The Women's College Hospital and Dispensary, 125 Rusholme Road, contemplates the erection of a hospital on Rusholme Road, to cost $60,000; Gordon & Helliwell, Confederation Life Building, are the architects. Architect Geo. B. Post, New York City, is preparing plans for a hotel for the Anglo-American Hotel Company, to cost $2,000,000; W. S. Dinnick, 84 King St. East, Toronto, is the secretary.

Windsor, Ont.—The work on a club house for the Knights of Columbus has been postponed; G. Jacques & Company, architects.

FIRE LOSSES.

Barrie, Ont.—The Board of Education school at Barrie was destroyed by fire; loss $100,000.

Campbellford, Ont.—Dickson Bridge Company's factory was destroyed by fire; loss $60,000.

Cayuga, Ont.—John Ranston's grist mill was destroyed by fire; loss $10,000.

Charlottetown, P.E.I.—The town of Summerside was damaged by fire; loss $325,000.

Emsdale, Ont.—J. W. MacDonald's store was destroyed by fire; loss $5,000.

Fonthill, Ont.—A. McGlashan's residence was destroyed by fire; loss $6,000.

Halifax, N.S.—Pickford & Black's wharf at Halifax was destroyed by fire.

Hamilton, Ont.—The National Machinery and Supply Co.'s. 76 Wellington street north, factory was destroyed by fire; loss $20,000.

Manneheim, Ont.—Eph. Devitt's barn and drive sheds were destroyed by fire; loss $3,000.

Ottawa, Ont.—The Rolla L. Crain Co., Ltd., Spruce street printing plant was destroyed by fire; loss $150,000.

Peterboro, Ont.—The Quaker Oats Company's Peterboro factory was destroyed by fire; loss $500,000.

Port Stanley, Ont.—Stevens Hartlip's residence was destroyed by fire; loss $2,000.

Prince Albert, Sask.—Windsor Hotel was destroyed by fire; loss $50,000.

Prince Albert, Sask.—MacLeod Co., Ltd., department store was destroyed by fire; loss $20,000 on the building, and on the stock $175,000.

Rockland, Ont.—The Roman Catholic congregation church at Rockland was destroyed by fire; loss $100,000.

Simcoe, Ont.—The Delhi Mitt Factory was destroyed by fire; loss $20,000.

Springfield, Ont.—Mr. Reichheld's hotel was destroyed by fire; loss $10,000.

Stouffville, Ont.—Todd & Cook's warehouse was destroyed by fire; loss $10,000.

Toronto, Ont.—The car barns of the Toronto Railway Company, King street east, were destroyed by fire; loss $100,000.

Tullamore, Ont.—The rectory of the Anglican Church was destroyed by fire; loss $2,500.

MISCELLANEOUS.

Cochrane, Ont.—The Frederick House and Abitibi Pulp Wood Co., Cochrane, contemplates the erection of a pulp mill, to cost $150,000.

Fort William, Ont.—The Terminal Elevator Co., Fort William, contemplates the erection of a grain elevator, to cost $130,000.

Hamilton, Ont.—W. H. Yates, Jr., 244 Leeming St., has been awarded the contract for the erection of an ice-house for the Abso Pure Ice Co., Barton St. East, to cost $8,000.

Hamilton, Ont.—The Salvation Army, Rebecca and Humphrey Sts., contemplates the erection of a rescue house, to cost $25,000. T. Ramsden, Lister Building, has been awarded the carpenter contract in a garage for Thos. Ramsey, 15 Market Square, to cost $15,000; R. Isbister, 65 Hughson St., has been awarded the mason contract, and are also the general contractors; E. B. Patterson, 143 Wentworth St. North, is the architect. The City of Hamilton contemplates the erection of bath houses, to cost $7,000.

Kingston, Ont.—The Dominion Government, Ottawa, contemplates the erection of a limestone mill at Kingston.

London, Ont.—Architect J. H. Tramanhouser Co., Ltd., Temple Building, Toronto, have prepared plans for flour mills for Hunt Brothers, Ltd., Talbot St. South, to cost $40,000.

Montreal, Que.—The Grand Trunk Railway Company are constructing a plant at Montreal for repairing freight and passenger cars; it is estimated to cost $700,000.

Niagara Falls, Ont.—C. M. Barter, Main St., Niagara Falls, is the architect for a fire hall to be built on Walnut and Kitchener Sts. by the City of Niagara Falls, to cost $20,000.

Ottawa, Ont.—Arrangements have been completed for the construction of a large floating drydock at Vancouver.

Ottawa, Ont.—The City of Ottawa will erect swimming baths to cost $75,000. The City of Ottawa will erect a garbage destruction plant, to cost $50,000. Work has started on a shop for Mrs. J. de St. Denis Lemoine, 505 Wilbrod St., to cost $6,000.

Ottawa, Ont.—The Trussed Concrete Steel Company of Canada, Limited, Walkerville, have been awarded the reinforcing steel contract in a garage for the Ottawa Car Co., Slater St., to cost $60,000; Sutherland & Son, 216 Cooper St., are the general contractors; W. E. Noffke, Plaza Building, is the architect.

Port Arthur, Ont.—The Hydro Electric Commission, University Ave., Toronto, contemplates the erection of a power plant. J. J. Carrick, Port Arthur, Ontario, contemplates the erection of a pulp mill, to cost $1,000,000.

Port Stanley, Ont.—M. J. Hogan, Port Burwell, Ontario, has been awarded the contract for the completion of a breakwater for the Dominion Government, to cost $130,000.

Stratford, Ont.—McIntosh Granite Co., 1623 Yonge St., Toronto, have been awarded the general contract for the erection of a mausoleum for Dr. W. H. Hamilton, Fort William, to cost $7,000; J. S. Russell, Gordon Block, Stratford, is the architect.

Toronto, Ont.—Architect G. W. Gouinlock, Temple Building, is preparing plans for lavatories for the National Exhibition Board, 38 King St. East, to cost $25,000. R. A. L. Gray & Co., 85 York St., has been awarded the wiring and fixture contracts in the municipal incinerator on Don roadway for the City of Toronto. Architects Darling & Pearson, 2 Leader Lane, are preparing plans for a mausoleum for the Toronto General Burying Ground Trustees, Confederation Life Building, Toronto, at Mount Pleasant Cemetery, to cost $200,000.

Welland, Ont.—The town of Welland contemplates the erection of a fire hall. Wm. Mitchell, Welland, Ontario, has been awarded the general contract for the erection of a barracks for the Salvation Army, to cost $4,000.

PLANTS, FACTORIES AND WAREHOUSES.

Acton, Ont.—J. B. Mackenzie, Georgetown, Ont., has commenced work on a factory for the Reliance Shoe Company, Toronto, to cost $15,000.

Belleville, Ont.—The Maple Leaf Tire Company, Belleville. contemplates the erection of an addition to their factory.

Brantford, Ont.—The city of Brantford contemplates the erection of a filtering and chlorinating plant; T. Harvey Jones, City Engineer.

Cornwall, Ont.—Anglin's, Limited, 65 Victoria street, Montreal, have been awarded the general contract for the erection of an addition to the factory of the Canadian Cotton Co., 28 Victoria street, Montreal, to cost $30,000.

Grimsby, Ont.—The Metal Craft Company, Grimsby, contemplates the erection of a factory, to cost $12,000.

Guelph, Ont.—Rundle & Son, Clark street, have been awarded the mason contract in the factory of the Dalyte Lamp Co., Ltd., Guelph, to cost $15,000. Geo. Walker, 32 Tiffany street, has been awarded the carpenter contract; Frank & Shuett, 92 Macdonell street, have been awarded the sheet metal and iron work contracts; W. A. Mahoney, 73 Quebec street west, is the architect.

Hamilton, Ont.—The Desmond-Stephen Co., 44 Market street, contemplates the erection of a factory on Market street.

Hamilton, Ont.—Architects Prack & Perrine, Lumsden Building, Toronto, are preparing plans for a factory for the Canadian Westinghouse Company, to cost $50,000. The work on the addition to the factory of the American Car Company will not proceed until after the war; the addition will cost $25,000. H. C. Gummo, 15 Tuckett St., has been awarded the general contract for the erection of a warehouse for C. Miles, 95 King St. East, to cost $5,000.

Hamilton, Ont.—W. H. Cooper, Clyde Block, has been awarded the mason contract in the factory of the Tallman Brass and Metal Co., to cost $50,000; J. C. Boswell, 140 Wellington street, has been awarded the painting and glazing contracts; J. E. Riddell, 14 Ferguson avenue north, has been awarded the roofing contract; E. Goodall, 96 Aikman avenue, is the general contractor; Stewart & Witton, 7 Hughson street, are the architects. W. H. Yates, Jr., 24 Leeming street, has been awarded the general contract for the erection of an ice storage plant for the Abso-Pure Ice Co., Barton street east, to cost $8,000.

Hickson, Ont.—Jencks Machine Co., St. Catharines, Ont., have been awarded the contract for the installation of the boilers and stack in the factory of the Canadian Milk Products Ltd., Mail Building, Toronto, to cost $15,000; McKinney, Woodstock, Ont., has been awarded the general contract.

Kincardine, Ont.—J. B. Watson, Princess street, contemplates the erection of a factory, to cost $50,000.

Kitchener, Ont.—The Woelfle Shoe Company contemplates the erection of a factory, to cost $10,000; Chas. Cowan, Victoria St., is the architect.

Lindsay, Ont.—Rhys Williams, Lindsay, Ont., have been awarded the concrete and brick work contracts in a cold storage plant for Flavelle, Limited, Kent street, to cost $60,000; G. M. Miller & Co., 93 Yonge street, Toronto, are the architects.

London, Ont.—Kentchersed & Rolls, Kansas City, have purchased a site for the erection of a broom factory at London, to cost $75,000.

New Toronto, Ont.—Fiddes & Hogarth, 122 King street east, have been awarded the heating contract in the factory for the Dominion Abrasive Wheel Company, to cost $65,000; Toms Construction Co., Kent Building, Toronto, are the general contractors.

New Toronto, Ont.—Purdy-Mansell, Limited, 63 Albert street, Toronto, have been awarded the plumbing contract in the factory for the Goodyear Tire and Rubber Company, Limited, 152 Simcoe street, to cost $750,000; Dominion Construction Company, 152 Simcoe street, are the general contractors; W. D. Spengler, 152 Simcoe street, is the engineer.

Ottawa, Ont.—Cuthbertson & Clark, 143 Hawthorne street, have commenced work on a factory on Hinton avenue, for the Capital Wire Cloth Mfg. Co., Ottawa, to cost $9,500; Richards & Abra, 126 Sparks street, are the architects.

Owen Sound, Ont.—The Keenen Woodenware Co., Owen Sound, will erect an addition to their factory, to cost $15,000.

Owen Sound, Ont.—The Northern Bolt, Screw and Wire Co., Ltd., Owen Sound, Ont., contemplates the erection of a keg mill and factory addition; J. M. Kilbourn, president.

Quartsino, Ont.—The Colonial Pulp and Paper Mills, Ltd., Quartsino, Ont., contemplates the erection of a sulphite plant.

Smith's Falls, Ont.—The Canadian Cooperage Co., Smith's Falls, contemplates the erection of a factory, to cost $20,000; F. F. Kessel, manager.

St. Catharines, Ont.—Architects Denison & Stephenson, 18 King street west, Toronto, have prepared plans for an addition to the factory of Kinleith Paper Co., St. Catharines, to cost $6,000.

Toronto, Ont.—Work has started on alterations to freight offices for the Grand Trunk Railway, to cost $6,500. Jackson & Lewis, contractors, Bell Telephone Building, have received tenders for the erection of a warehouse for Cassidy's, Ltd., 51 St. Paul St. West, Montreal, to cost $90,000; MacVicar & Heriot, 104 Union Ave., Montreal, are the architects.

Toronto, Ont.—T. Pringle & Sons, Excelsior Life Building, have received tenders for the erection of a warehouse and garage for Clarkson-Jones Estate, Sun Life Building, to cost $18,000. The Toronto Furnace and Crematory Co., 111½ King street east, have been awarded the heating contract in the addition to the factory of the National Electric and Heating Company, 544 Queen street west, to cost $5,000; L. E. Dowling, 167 Yonge street, is the general contractor. Jas. Hicks, 144 Montrose avenue, has been awarded the mason contract in the factory of the Dominion Machinery Co., 110 Church street, to cost $7,000; A. B. Ormsby, 48 Abell street, have been awarded the skylight and metal sash contracts. Geo. R. Baker, 37 Lappin avenue, has been awarded the plumbing and heating contracts in the store and warehouse for H. H. Williams, 38 King street east, Toronto, to cost $30,000; W. R. McGiffon Co., Ltd., 54 Roncesvalles avenue, have been awarded the carpenter contract; G. W. Wood, 613 Manning avenue, has been awarded the mason contract; C. J. Gibson, 51 Yonge street, is the architect.

Welland, Ont.—Ryan & Gardiner, Main street, have been awarded the general contract for the erection of an addition to the plant of the Canadian Steel Foundries, Limited.

Whitby, Ont.—The Canadian Tractor Company contemplates the erection of a factory, to cost $60,000.

PUBLIC BUILDINGS AND STATIONS.

Galt, Ont.—The Hydro-Electric Commission are preparing plans for an addition to their station on Dickson street. Robert Elliott, superintendent.

Ottawa, Ont.—R. C. Desrochers, Secretary of Public Works, has received tenders for completion of the public building at Three Rivers, P.Q.

Preston, Ont.—John Hayman & Sons, 482 Wellington street, London, have commenced work on an addition to the Hydro station for the Hydro-Electric Commission, Toronto, to cost $10,000.

Tillsonburg, Ont.—The Hydro-Electric Commission contemplates the erection of a power station at Tillsonburg, to cost $15,000.

Welland, Ont.—The Hydro-Electric Commission have received tenders for the erection of a transformer station at Welland, to cost $50,000.

RESIDENCES, STORES AND FLATS.

Hamilton, Ont.—Architect E. B. Patterson, Wentworth St. North, has prepared plans to convert a store into an apartment house, to cost $5,000; Ed. Mathews, 221 John St. North, is the owner.

Oakville, Ont.—The Canadian Engineering and Contracting Company are excavating for a residence for W. F. Eaton, on Ravenscliffe Ave., to cost $40,000; Munro & Mead, 34 Hughson St., are the architects.

Renfrew, Ont.—Wm. Hastings, Renfrew, has been awarded the plumbing and heating contract in the stores and apartments for John Mitchell, to cost $20,000; G. T. Moore, Renfrew, has been awarded the general contract; B. Evan Parry, is the architect.

Thornhill, Ont.—The Board of Control of Toronto has sent a project on to the City Council for approval that fireproof cottages for boys should be built at the Men's Industrial Farm; they will cost $75,000.

Toronto, Ont.—Work has commenced on a pair of residences for W. A. Scott, 125 Mutual St., on Victoria Ave., to cost $7,000; P. H. Finney, 79 Adelaide St. E., is the architect. L. E. Dowling, 167 Yonge St., has been awarded the general contract for the erection of a store on Yonge St. for Mr. Powell, 380 Yonge St., to cost $6,000. The Board of Control has sent a project on to the City Council for approval that fireproof cottages for girls should be built at the Women's Industrial Farm; they wil lcost $75,000.

Toronto, Ont.—R. M. Leslie, 1027 Gerrard St. East, has been awarded the hot water heating contract in the residence of Chas. Bully, 119 Dinnick Crescent, on Pembroke St., to cost $5,000; Mr. McConnell, Cosgrave Building, is the architect. W. H. Addison, 801 Carlaw Ave., has been awarded the plastering contract in a residence for A. A. Thompson, 88 Warren Road; Thos. Lunn, Toronto, has been awarded the painting contract; Edwards & Edwards, 18 Toronto St., are the architects. Kerr & Martin, 25 Howland Ave., have been awarded the general contract in the residence of J. A. Trebilcock, 153½ Queen St. West, to cost $6,000; W. Bredin Galbraith, Traders Bank Building, is the architect.

Walkerville, Ont.—The Border City Supply Company, 5 Pitt St. West, Windsor, Ontario, have received tenders for the erection of a residence for H. F. Metcalfe, Kingston Business College, Kingston, Ontario, to cost $5,000.

Windsor, Ont.—Work has commenced on a residence for Winter, Williamson & Little, Pitt St. West, Windsor, to cost $5,000.

SCHOOLS, COLLEGES AND CHURCHES.

Creemore, Ont.—The by-law authorizing bonds for the erection of a school to cost $16,000 at Creemore was upheld by the court.

Creemore, Ont.—H. M. Coshett, secretary of the Public School Board, will call for tenders shortly for the erection of a school at Creemore, to cost $16,000.

Hamilton, Ont.—John Milburn, 22 William street, has been awarded the general contract for the erection of a church for the Roumanian Greek Orthodox Church, to cost $3,000. Architect Gordon Hutton, Bank of Hamilton Building, will call for tenders about February 1st for the erection of an addition to the Adelaide Hoodless School, Maple avenue, to cost $40,000.

McGregor, Ont.—The School Boards No. 8 Anderson and No. 11 Colchester have abandoned the project of the erection of a school to cost $10,000; G. Jacques & Co., 5 Sandwich street west, Windsor, are the architects.

McGregor, Ont.—Architects G. Jacques & Co., Pensular Security Building, Chatham street west, Windsor, are preparing new plans for a school, to cost $7,000; A. J. Barnars, McGregor, is the secretary for the School Board.

Preston, Ont.—The Methodist congregation contemplates the erection of an addition to their Sunday school, to cost $15,000; Rev. D. A. Walker, pastor.

St. John, N.B.—Architect H. Claire Mott, St. John, N.B., has received tenders for the erection of a new school building at Glen Falls, Coldbrook, N.B.

Swansea, Ont.—The Dickie Construction Co., Ryrie Building, Toronto, have been awarded the general contract for the erection of a church for the Morningside Presbyterian Church, to cost $30,000; J. M. Jeffrey, care of Sharp & Brown, 18 Wellington street east, Toronto, is the architect.

Tweed, Ont.—McKelvey & Birch, 69 Brock street, Kingston, have been awarded the plumbing and heating contract in a school for the Board of Education, to cost $20,000; A. MacPherson, Toronto, has been awarded the electric wiring contract; Houston Company, Limited, Tweed, are the general contractors; Ellis & Ellis, Manning Chambers, Toronto, are the architects.

Toronto, Ont.—The Board of Education, 263 College street, has purchased a site at the corner of Glenholme and Earnscliffe avenue, for the erection of a school, to cost $100,000; W. C. Wilkinson, secretary.

Toronto, Ont.—The Board of Education contemplates the erection of an addition to Perth Avenue School, to cost $60,000. R. Chalkley & Sons, Ltd., 34 Victoria street, have been awarded the mason contract on the addition to Orde Street School, to cost $70,000; Concrete Construction Company have been awarded the reinforced concrete contract; Frank Armstrong, rear 89 Oak street, has been awarded the carpenter contract; Beaver & Co., 62 Winchester street, have been awarded the plastering contract; D. M. Rowe & Co., 30 Atkins avenue, have been awarded the sheet metal and roofing contracts; Canada Ornamental Iron Co., 88 River street, have been awarded the ornamental iron contract; J. Phinnemore, rear 367 Dupont street, has been awarded the painting and glazing contracts; Fred Armstrong Co., Limited, 273 Queen street west, have been awarded the plumbing, electric wiring, heating and ventilation contracts; Johnson Temperature Regulating Company, 118 Adelaide street west, have been awarded the heat regulator system contract; Canada Glass, Mantel and Tile Company, 45 Richmond street, have been awarded the terrazzo floors contract.

THE MODERN INDUSTRIAL BUILDING.

By Edward H. Putnam.

The general improvement in American architecture is easily apparent in the construction of the modern industrial building. Careful study of proportion and decorative treatment is the rule rather than the exception, and the bleak, barren waste of the cheapest material obtainable belongs to the past. The factory building of to-day, while strictly utilitarian, is built on the principle that economy is not of necessity limited to a saving in initial cost. The aesthetic appeal is considered, and even in instances of Spartan simplicity the crude and unsightly are carefully avoided.

There is some excuse for the old-time ramshackle structures; building materials were not on a par with those in vogue to-day and selection was limited. Steel construction was in its infancy, reinforced concrete was unknown and architectural terra cotta had not reached its present development as a practical as well as an ornamental structural material. Hollow tile and stucco were not even dreams. Even brick had not its present flexible versatility.

That the spirit was willing is attested by the occasional presence of a microscopic garden or ivy covered office tucked away in the middle of a waste of coal trestles, boiler houses and long, low, dingy buildings covered with soot and dust. The attractive approach, while not totally lacking, was unusual.

Undoubtedly steel construction has had a great deal to do with the changed conditions. Large, heavy piers that shut out sunlight and air have no part in recent construction, and the factory building is frequently a mere skeleton enclosed in steel sashed windows.

The modern policy of publicity is largely accountable for the improvement. Situated by railroads, as most factories naturally are, there is an excellent chance of prepossessing the thousands that pass daily in favor of an article that is manufactured in a clean, well-lighted, sunny building. Clothes do not make the man, but we are certainly more favorably impressed by a clean shirt than by a dirty one with frayed cuffs, and the same principle applies to buildings.

There are other reasons more practical, perhaps, but equally intangible; reasons that have to do with the hackneyed and over-used words, "psychology" and "efficiency." There can be no doubt that a clean, attractive, well-lighted and ventilated building keeps the workman more alert mentally, more satisfied, and less inclined to listen to the malcontent and the agitator. He is healthier, happier, and his efficiency increases automatically.

The large number of food product buildings condemned as unsanitary some years ago has forced a marked improvement in buildings of this character. The best-known firms have made cleanliness a visible asset. An interesting example, and one in which many materials are used in a supplementary way, is the Sheffield Farms dairy. The three-story elevation of the main building is a reinforced concrete frame covered with a veneer of lustrous glazed white architectural terra cotta, a combination which is practically indestructible. The terra cotta protects the concrete from fire and weather, offers little foothold for soot or dirt, and is very easily cleaned down with soap and water. In this instance advantage is also taken of the decorative possibilities of architectural terra cotta; the name panels are raised in white against backgrounds of green, the keystones of the window arches show a conventional milk bottle in white against green, and the large cartouches under the cornice are in the shape of a cow's head executed in the natural colors of the Jersey cow. Surely an appropriate form of decoration! Instead of the usual pressed metal the panels between the window courses are of light green glazed terra cotta. The superstructure is of common brick covered with thin cement stucco artificially jointed to reproduce the effect of the lower stories. The walls of the large bottling room, four stories high, are also of lustrous glazed white terra cotta, and, if necessary, can be cleaned down with a hose. Bottling is done by the gravity system. The milk is hoisted to the top and comes out in sealed bottles at the delivery level.

One of the most usual forms of the industrial building is the unadorned frame of reinforced concrete. Properly constructed, its durability and efficiency are beyond question, and its strong, simple lines and uniform gray color give an impression of solid worth and not infrequently an impression of what might be called rugged dignity or grim beauty. As a matter of fact the impression of mass is misleading, for the piers are usually very slender to permit maximum window space, and a multitude of large windows more than anything else is the unfailing sign of a thoroughly up-to-the-minute factory. One very real advantage of reinforced concrete is that it is a rapid form of construction.

Brick always has and always will hold its own as one of the most popular building materials for industrial buildings, and brick to-day is a far more adaptable material than it ever was before. A monotonous even red used to be the one aim, and off-color brick were sold as "seconds." Almost a complete about-face in this particular is an indication of the improved public taste. Brick of uneven shade have become so popular that manufacturers are specializing along this line. Pattern work in brick-laying has come into vogue, and instead of the smooth-faced brick of other years many rugged textures have been introduced and have met with immediate favor. A brick factory to-day may express the highest type of architecture and at the same time be practical and thoroughly economical.

Just as the war has affected every other line of endeavor this year, it has had a peculiar effect upon the erection of factories. The most apparent effect is one of stimulation; many factories of many kinds are cropping up all over the country, as a direct result of the war, but dependent upon the continuance of the war to dispose of their output. For that reason a large number of them are little more than temporary, and erected as an investment with the greatest haste and in the cheapest possible way in order that the returns upon the investment may be immediate and generous. This necessity and the probability of closing down at the end of the war have caused a mush-room growth of flimsy shacks with one seemingly durable feature, the high fence that surrounds them.

On the other hand, the money that these makeshift factories have brought in has undoubtedly enabled many firms to erect modern plants for the production of materials that are staple in normal times.

And there is another direct result of the war. We are beginning to manufacture a number of products that formerly were imported, and the great majority of these adopted industries will become permanent naturalized residents. Each one must be housed, and there is little doubt that our present knowledge of what constitutes good industrial construction will be applied with excellent results.—"American Architect."

CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

Building, Canadian Kodak Co., Ltd., Factory, Kodak Heights, Toronto, Ont.

Contractors, Deakin Construction Co., Ltd., Montreal, Que.
Brick, Medina Shale Brick Co., Streetsville, Ont.; Don Valley Brick Works, Toronto, Ont.
Boilers, Babcock & Willcox, Toronto.
Boiler Feed, Pump, Blake Knowles, Toronto.
Cabinet and Woodwork, H. W. Switzer, Toronto.
Cement, Canada Cement Co., Ltd., Toronto.
Concrete Work, Deakin Construction Co., Ltd., Montreal, Que.
Cranes, Northern Crane Works, Ltd., Walkerville.
Chimneys, Custodis Co., Toronto.
Concrete Piles, McArthur Concrete Pile Co., New York.
Conveyors, Lamson Co., Toronto.
Air Washers, Canadian Buffalo Forge Co., Ltd., Kitchener.
Coal Scale, Richardson Scale Co., Bridgeburg.
Elevators, Otis-Fensom Co., Ltd., Toronto.
Fire Alarm System, Purdy Mansell Co., Ltd., Toronto.
Fire Doors, H. B. Ormsby & Co., Ltd., Toronto.
Fire Hose, Dunlop Rubber Co., Ltd.
Fire Pump, A. R. Williams Machinery Co., Ltd., Toronto.
Floor Covering, H. H. Symmes & Brother, Montreal, Que.
Fittings and Valves, Jenkins Bros., Ltd.
Gaskets, Howe & Bassett, Rochester, N.Y.
Glass, Pilkington Bros. Glass Co., Ltd., Toronto, Ont.
Hardware, Yale & Towne Co., St. Catharines.
Hollow Tile, National Hollow Tile Co., Toronto.
Insulation, Armstrong Cork and Insulation Co., Toronto.
Inter-Phone System, Stromberg-Carlson Electric Co., Toronto.
Ice Machinery, Canadian Ice Machinery Co., Ltd., Toronto.
Kitchen Utensils and Equipment, Wrought Iron Range Co., Ltd., Toronto.
Metal Cornice, Douglas Bros., Ltd., Toronto.
Marble, Canada Glass Mantles and Tile Co., Ltd., Toronto.
Plumbing, Purdy, Mansell & Co., Ltd., Toronto.
Plaster Work, Deakin Construction Co., Ltd., Montreal, Que.
Preservative Wood, Dominion Paving and Contracting Co., Toronto.
Paints, Interior, Sherwin-Williams & Co., Ltd., Toronto; Exterior, Trussed Concrete Co., Stone-Tex., Toronto; Cold Water, A. Ramsay & Son, Montreal, Que.
Packing, Garlock Packing Co., Toronto.
Power Machinery, Prime Movers, John Inglis Co., Ltd., Toronto; Motors, Canadian Westinghouse Co., Ltd., Toronto; Pumps, Fairbanks Morse Canadian Co., Ltd., Toronto.
Refrigeration Machinery, Canadian Ice Machinery Co., Ltd., Toronto.
Refrigerator Doors, John Hillock & Co., Ltd., Toronto.
Radiators, Taylor-Forbes, Ltd., Toronto.
Refrigeration Equipment, Canadian Ice Machinery Co., Ltd., Toronto.
Reinforcements, Steel Co. of Canada, Ltd., Hamilton, Ont.
Roofing, Tar and Gravel, Douglas Bros, Ltd., Toronto.
Steel Reinforcing, Steel Co. of Canada, Ltd., Hamilton.
Steel Testing, R. W. Hunt & Co., Ltd., Montreal, Que.
Structural Iron and Steel, Standard Steel Construction Co., Ltd., Welland.
Smoke Flue and Breech, Toronto Iron Works, Ltd., Toronto.
Sprinkler Equipment, Purdy, Mansell & Co., Ltd., Toronto.
Tanks, Polson Iron Works, Ltd., Toronto.
Testing, Canadian Inspection and Testing Laboratories Co., Ltd., Toronto.
Wood Treating, Dominion Paving and Contracting Co., Toronto.
Water Heater, Sims Water Heater Co., Toronto.
Water Softener, Kennicott Water Softener Co., New York.
Landscape Architects, Harries & Hall, Bay street, Toronto.

* * *

Building, Christie, Brown & Co., Ltd., Factory and Office Building, Toronto, Ont.

Architects, Sproatt & Rolph, Toronto, Ont.
Engineers, Jennings & Ross, Toronto.
Brick, Plain, John Price, Toronto; Fancy, Don Valley Brick Works, Ltd., Toronto; Enameled, Scott, Hammond & Pratt, Toronto.
Casements and Window Construction, Henry Hope & Sons, Ltd., Toronto.
Concrete Work, Jennings & Ross, Toronto.
Electric Fixtures, E. F. W. Salisbury, Toronto.
Electric Wiring and Apparatus, E. F. W. Salisbury, Toronto.
Expanded Metal, Clarence W. Noble, Toronto.
Fire Alarm System, E. F. W. Salisbury, Toronto.
Fire Doors, A. B. Ormsby & Co., Ltd., Toronto.
Fire Escapes, McGregor & McIntyre, Ltd., Toronto.
Glass, Consolidated Plate Glass Co., Ltd., Toronto.
Ornamental Iron, McGregor & McIntyre, Ltd., Toronto.
Plaster Work, Jennings & Ross, Toronto.
Roofing, H. Williams & Co., Toronto.
Screens, Higgins Mfg. Co., Toronto.
Sprinkler Equipment, W. J. McGuire, Ltd., Toronto.
Stone, Geo. Oakley & Sons.
Structural Iron and Steel, McGregor & McIntyre, Ltd., Toronto.
Tile, National Fireproofing Co., Toronto.
Vaults, J. & J. Taylor, Ltd., Toronto.
Water Tank, Des Moisnes Bridge and Iron Co., Pittsburg, Pa.
Weather Strip, Higgin Mfg. Co., Toronto.
Contractors (general), Jennings & Ross, Toronto.

CATALOGUES and BOOKLETS

Eureka Water Pumps and Systems.—The Bishop-Babcock Becker Company, Cleveland, Ohio, have issued Catalogue B33. It describes in detail the various systems they manufacture. The Eureka systems are complete, covering pumps and systems which are operated by electric motors, gasoline or kerosene engines, city water pressure, or by hand, enabling water to be pumped from any source and delivered wherever desired. Capacity details and other tabular information is given. Copies can be had on application.

Pedlar's Salno Fire Door.—This book describes a product that is claimed to be radically different from any fire door heretofore known. The National Fire Protection Association demand that fire doors meet certain requirements, and apparently these have been amply accomplished by the manufacturers of these doors. A description covering the six types made, cuts and illustrations, hardware required, and blue prints, are included in this book. It is, in fact, as complete an edition of its kind as we have had the pleasure of reviewing for some time. By addressing the Pedlar People, Ltd., at any of their numerous branches this book may be obtained.

British Columbia Red Cedar Shingles is the title of an interesting booklet issued by the British Columbia Government. It is well known throughout the continent that British Columbia shingles are the highest grade shingles manufactured, owing to the fact that cedar reaches its best development in British Columbia. The best methods of laying, the right nails to use, how to use them, the reliability and economy of them, are all dealt with in this booklet, and the many advantages to be gained by promoting their use adds force to the argument that interprovincial commerce and trade should be encouraged to the best of our ability. By addressing the British Columbia Lumber Commissioner, Excelsior Life Building, Toronto, Ont., this and other valuable information may be procured.

The Webster Vacuum System of Steam Heating is the title of a profusely illustrated and attractively bound ninety-six page catalogue just issued by Darling Bros., Ltd., Montreal. It describes the progress of the firm during the past twenty-eight years in relation to the development of heating systems and the effect of a close study and the application of engineering principles towards bringing to its present state of efficiency the vacuum system of steam heating and the various accessory apparatus which they produce. It further contains many pages of valuable information illustrated with drawings on the Installation of the Webster System, besides describing this system and giving typical installations. Views are given throughout the catalogue of various Canadian buildings in which the Webster System is installed, which include some of the largest office buildings, hotels, public institutions, factories, apartment houses, and private residences in Canada. Other Webster Systems are described, including the Webster Pres-co Vacuum System, the Webster Hydro Pneumatic System, the Webster Hydro Vacuum Control System, and the Webster Modulation System. Feed Water Heaters are illustrated and described, as well as other special apparatus relating to control and efficiency. This catalogue should be in the hands of every architect and engineer of Canada, and a card mentioning "Construction" will result in a copy being sent.

Planning and Specifying Interior Lighting.—Illumination from Concealed Sources is the most comprehensive publication on lighting that has yet come to hand. Dealing, as it does, with this important subject, no facts or points of interest have been overlooked. With this data at his command the architect or illuminating engineer can design his own fixtures to harmonize with the specific interior, and be assured that the illumination will be ample in quantity, perfect in quality, and the combined artistic and lighting effect entirely in accord with the general period or scheme of decoration.

Scientifically designed X-ray eye comfort reflectors and accessories have been developed to meet the requirements for indirect illumination from ceiling fixtures of many types, floor pedestals, urns, portable floor and table art lamps, wall and pillar brackets, pillar capitals, corbels and cornices. This equipment has been standardized, and complete data, dimensional drawings, and other requisite information on the various types of reflector equipment are given.

It is stated that with this equipment, which has been adopted by the world's largest manufacturers, the efficiency of workmen is increased, and, since he is working under hygienic conditions, his services and good will are retained.

Twenty-four detail plates are enclosed with this portfolio, and they cover the field up to the present stage of development excellently.

It is the endeavor of this company to render valuable aid to the architect, and they emphasize that their staff of illuminating engineers is ready and willing at all times to co-operate as fully as desired in solving lighting problems in the most effective manner.

This portfolio of catalogue and plates will be forwarded upon request to the National X-Ray Reflector Co., 235 West Jackson Blvd., or to George J. Beattie, Canadian representative, 72 Victoria Street, Toronto, Ont.

◆

MANY GARAGES BUILT.

The number of garages built in Toronto during 1916 is an indication of the importance attained by this branch of construction. There were built last year 825 garages, representing a value of $300,000. This item does not include the permanent equipment, which would add from twenty-five to fifty per cent. to the above amount.

◆

JUBILEE ANNOUNCEMENT.

The firm of A. C. Leslie Company, Ltd., of Montreal, have just issued an announcement on the completion of fifty years of the company's history. Established a year before Confederation, this firm is considered as one of the pioneer business organizations in relation to the metal industry in Canada. They have always enjoyed a high place in the esteem of those with whom they have done business

BUILDING PERMITS.

Total value of permits issued at St. Catharines for the month ending November, 1916, was $57,470.00.

Total value of permits issued at Vancouver, B.C., for twelve months ending 1916, was $2,412,889.00; for twelve months ending 1915, was $1,593,229.00.

Total value of permits issued at Port Arthur, Ontario, for the year ending 1916, was one and a half million dollars.

Total value of permits issued at Galt, Ontario, for the year ending 1916, was over a quarter million dollars.

◆

WILL BUILD NEW FACTORY.

The Turnbull Elevator Company of Toronto have purchased a large factory site at the corner of Bloor and Lansdowne, consisting of about 4¼ acres, and comprising the larger portion of the old Dunlop property. The frontages include 425 feet on Bloor street, beginning about 367 feet west of Lansdowne avenue; 110 feet 10 inches on Lansdowne avenue, 360 feet on Janet avenue, 175 feet along the G.T.R. tracks, and 540 feet on Wade avenue. The average depth is around 120 feet. The price paid for the property is $106,000. A modern factory will be erected.

◆

TORONTO BRANCH CIVIL ENGINEERS.

The annual meeting of the Toronto branch of the Canadian Society of Civil Engineers was held at the rooms of the Society at the Engineers' Club, 30 King Street West, on Thursday, January 11th. The main business of the evening was the election of officers for the ensuing year. Reports from the various committees were received and disposed of. A suggestion which met with hearty approval, and towards which the executive will work, is that of making the members better acquainted with each other. The following officers were elected: Chairman, E. W. Oliver; secretary-treasurer, L. M. Arkley; executive committee, A. H. Harkness, T. T. Black, H. G. Acers, and E. A. Hewson.

◆

TECHNICAL SOCIETIES.

ALBERTA ASSOCIATION OF ARCHITECTS.—President, Jas. A. Henderson, F.R.I.B.A., Edmonton; Hon. Secretary, W. D. Cromarty, Edmonton.

ARCHITECTURAL INSTITUTE OF BRITISH COLUMBIA.—President, R. Mackay Fripp; Secretary, Fred L. Townley, 325 Homer St., Vancouver, B.C.

CANADIAN CEMENT AND CONCRETE ASSOCIATION.—President, Peter Gillespie, Toronto, Ont.; Secretary-Treasurer, Wm. Snaith, The Thor Iron Works, Toronto, Ont.

CANADIAN CLAY PRODUCTS' MANUFACTURERS' ASSOCIATION.—President, J. E. Frid, Hamilton; Secretary-Treasurer, G. C. Keith, Toronto.

CANADIAN ELECTRICAL ASSOCIATION.—President, Col. D. R. Street, Ottawa; Secretary, Alan Sullivan, Confederation Life Building, Toronto.

CANADIAN FORESTRY ASSOCIATION.—President, William Power, M.P.; Secretary, James Lawler, Journal Building, Ottawa.

CANADIAN GAS ASSOCIATION.—President, J. P. King, Stratford, Ont.; Secretary-Treasurer, Geo. W. Allen, 19 Toronto St., Toronto, Ont.

CANADIAN INDEPENDENT TELEPHONE ASSOCIATION.—President, W. Doan, M.D., Harrietsville, Ont.; Secretary-Treasurer, Francis Dagger, 21 Richmond St. West, Toronto.

CANADIAN INSTITUTE.—198 College St., Toronto. President, J. B. Tyrrell; Secretary, Mr. J. Patterson.

CANADIAN NATIONAL ASSOCIATION OF BUILDERS' EXCHANGES.—Western Section—President, C. R. Frost, 609 Second St., Edmonton, Alta.; Secretary-Treasurer, A. M. Frith, 224 McDougall Ave., Winnipeg. Eastern Section—President, Geo. Gander, Toronto; Secretary-Treasurer, P. L. Fraser, Builders' Exchange, Toronto.

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ONTARIO ASSOCIATION BUILDERS' EXCHANGE.—President, T. R. Wright, London, Ont.; 1st Vice-Pres., C. T. Pearse, Hamilton; 2nd Vice-Pres., A. Tomlinson, Chatham; Treasurer, Geo. Oakley, Jr., Toronto; Secretary, A. E. Flower, Toronto.

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QUEBEC BUILDERS' EXCHANGE.—President, J. A. Marier; Secretary-Treasurer, Alf. Cote.

ROYAL ARCHITECTURAL INSTITUTE OF CANADA.—President, Jos. P. Ouellet, Quebec; Vice-president, A. Frank Wickson, Toronto; Hon. Treasurer, J. W. Watts, Ottawa; Hon. Secretary, Alcide Chausse, Montreal.

SASKATCHEWAN ASSOCIATION OF ARCHITECTS.—President, A. Graham Creighton, Prince Albert; Vice-Presidents, R. G. Bunyard, Moose Jaw; J. C. Fortin, Regina; Secretary-Treasurer, Francis B. Reilly, Westman Chambers, Regina. Council—W. G. Van Egmond, Regina; Prof. Greig, Saskatoon; H. Cooper, Sasfatoon.

SOCIETY OF CHEMICAL INDUSTRY.—Wallace P. Cohoe, Chairman; Alfred Burton, Toronto, Secretary.

TECHNICAL SOCIETY OF PETERBOROUGH.—Bank of Commerce Building, Peterborough. President, M. C. Mills, P.O. Box 995, Peterborough, Ont.

TORONTO BUILDERS' EXCHANGE.—President, S. R. Hughes; Secretary, A. E. Flower.

UNION OF CANADIAN MUNICIPALITIES.—President, T. L. Church, Mayor of Toronto, Ont.; Hon. Secretary-Treasurer, W. D. Lighthall, K.C., ex-Mayor of Westmount; Asst. Secretary, G. S. Wilson, Coristine Building, Montreal.

CONSTRUCTION

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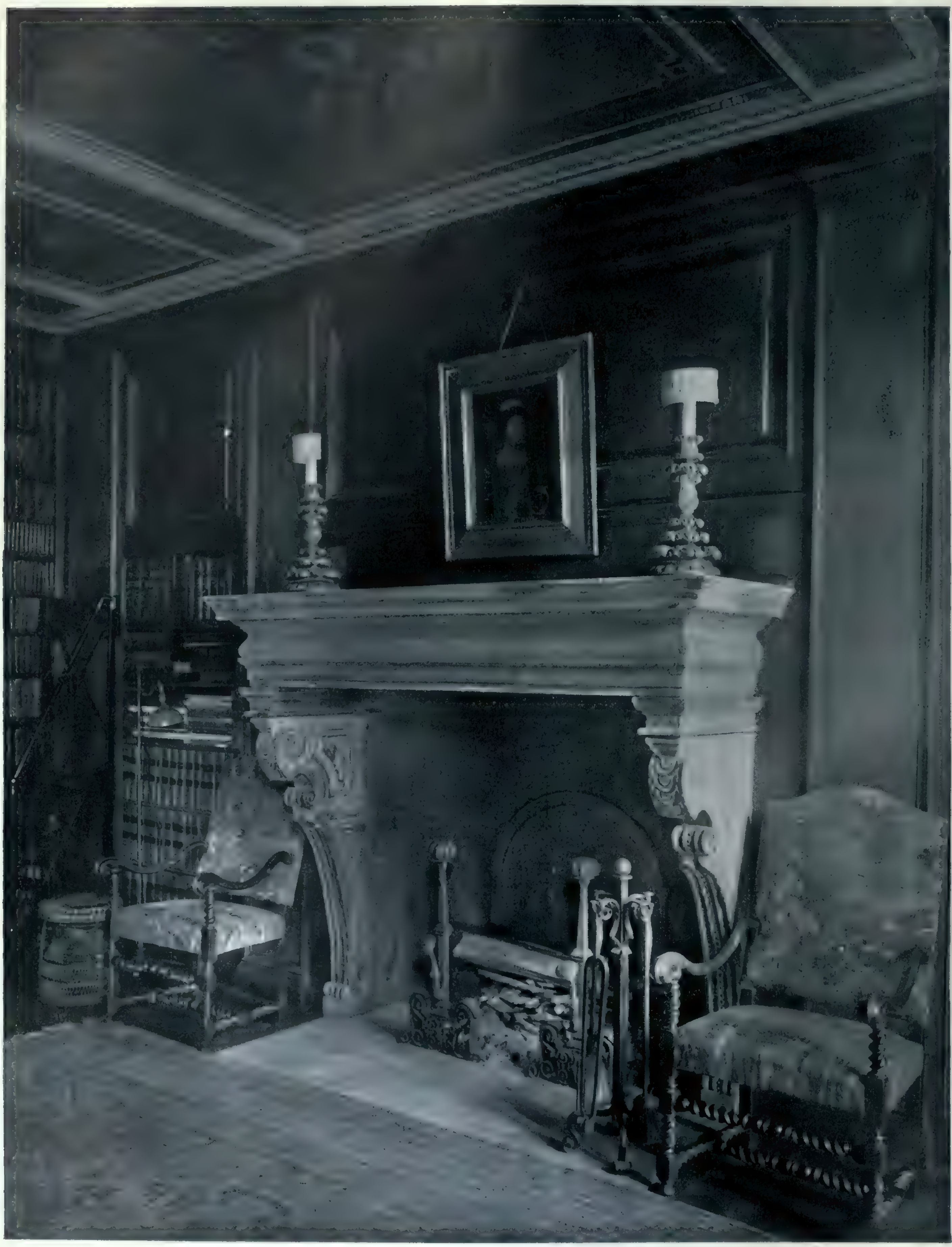
Full Page Illustrations

A LIBRARY FINISHED IN BUTTERNUT (Frontispiece) 44

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



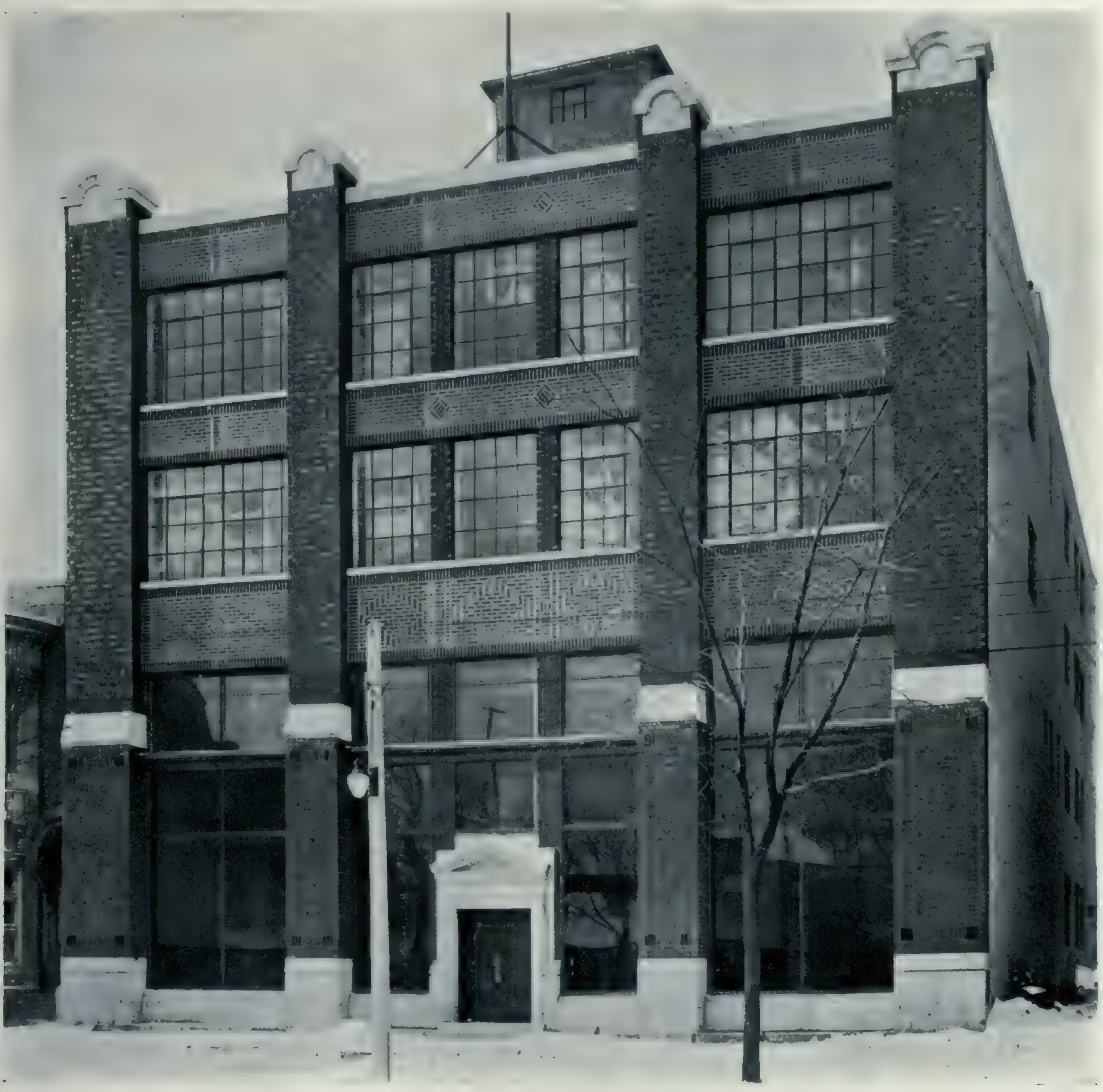
A LIBRARY FINISHED IN BUTTERNUT WITH A PAINTED AND DECORATED CEILING AND MANTEL IN THE ITALIAN STYLE. THE ANDIRONS ALSO ARE IN THE ITALIAN STYLE, BELONGING TO THE EARLY SIXTEENTH CENTURY. THE BOOKSHELVES LINE THE WALLS, SOLIDLY FROM FLOOR TO CEILING.

A Reinforced Concrete Garage, Toronto, Ont.

THE new home of the Automobile and Supply Company, Ltd., is located on the west side of University Ave., a short distance south of Anderson. It extends through to Simcoe Street, giving admission to the building from both ends. As University avenue is perhaps the greatest automobile thoroughfare in the city, and as its use for this purpose will probably very greatly increase in the future, the location is most undoubtedly an excellent one.

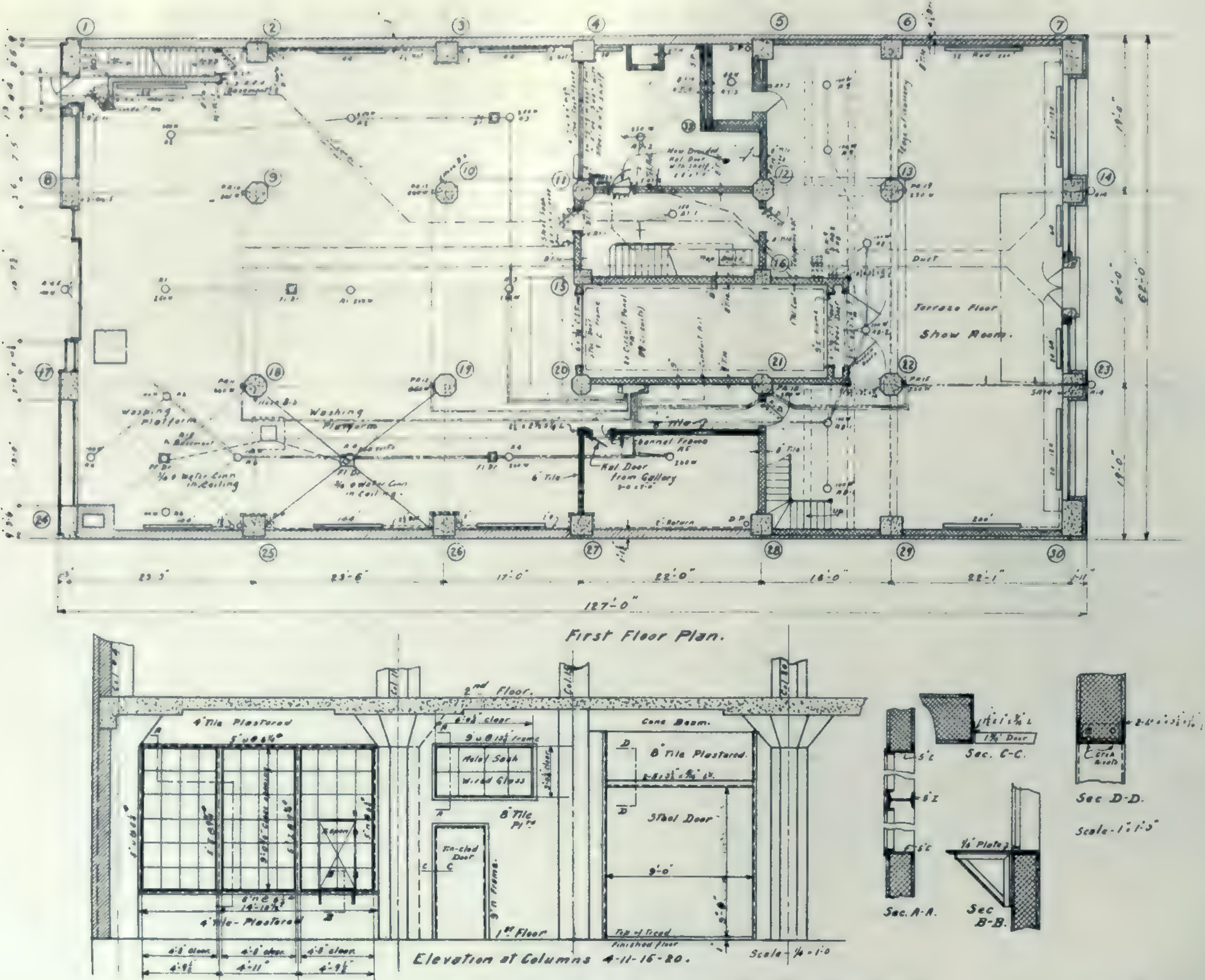
The building will be devoted to the sale, storage and repair of automobiles, and every facility for these purposes has been provided. It has a frontage of sixty-two feet on each street, and a length of one hundred and twenty-seven feet. It is four storeys in height, with a basement at the Simcoe street end.

The building is constructed of reinforced concrete with brick spandrel walls. The elevation on University avenue is faced with artificial stone and tapestry brick. The brick in the spandrels over the windows are buff in the centre of the panel and dark brown in the margin. The columns are faced with dark red brick with squares at the corners of the panels of enamelled green brick. The brick work joints are half an inch thick, and are raked out half an inch. On Simcoe street the concrete columns were allowed to show, only the spandrels over the windows being faced with brick. The outside columns and beams of the side walls are set back sufficiently to allow a course of brick to be carried

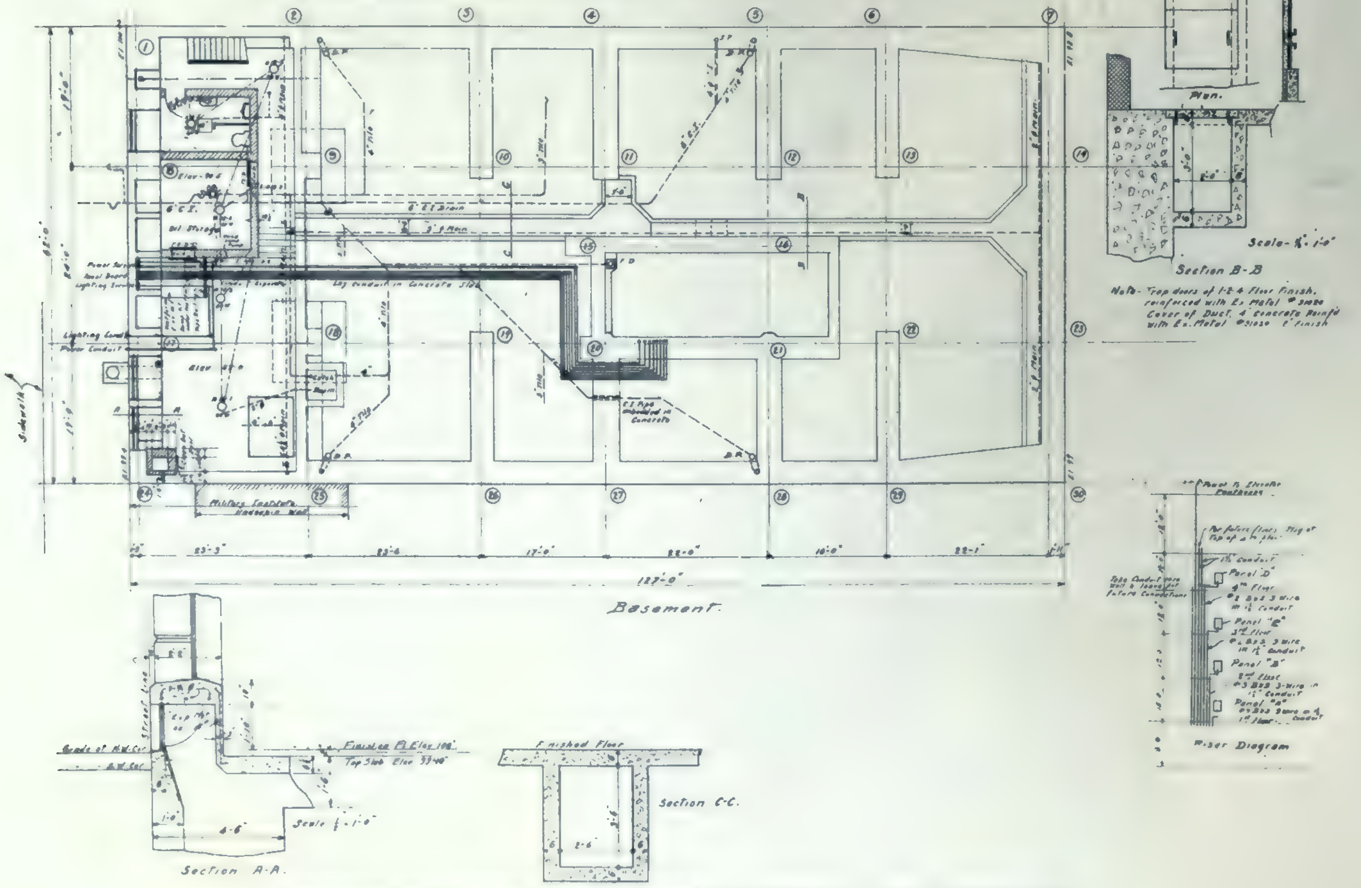


GARAGE, AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

HARKNESS & OXLEY, ENGINEERS. SHEPARD & CALVIN, CONSULTING ARCHITECTS.



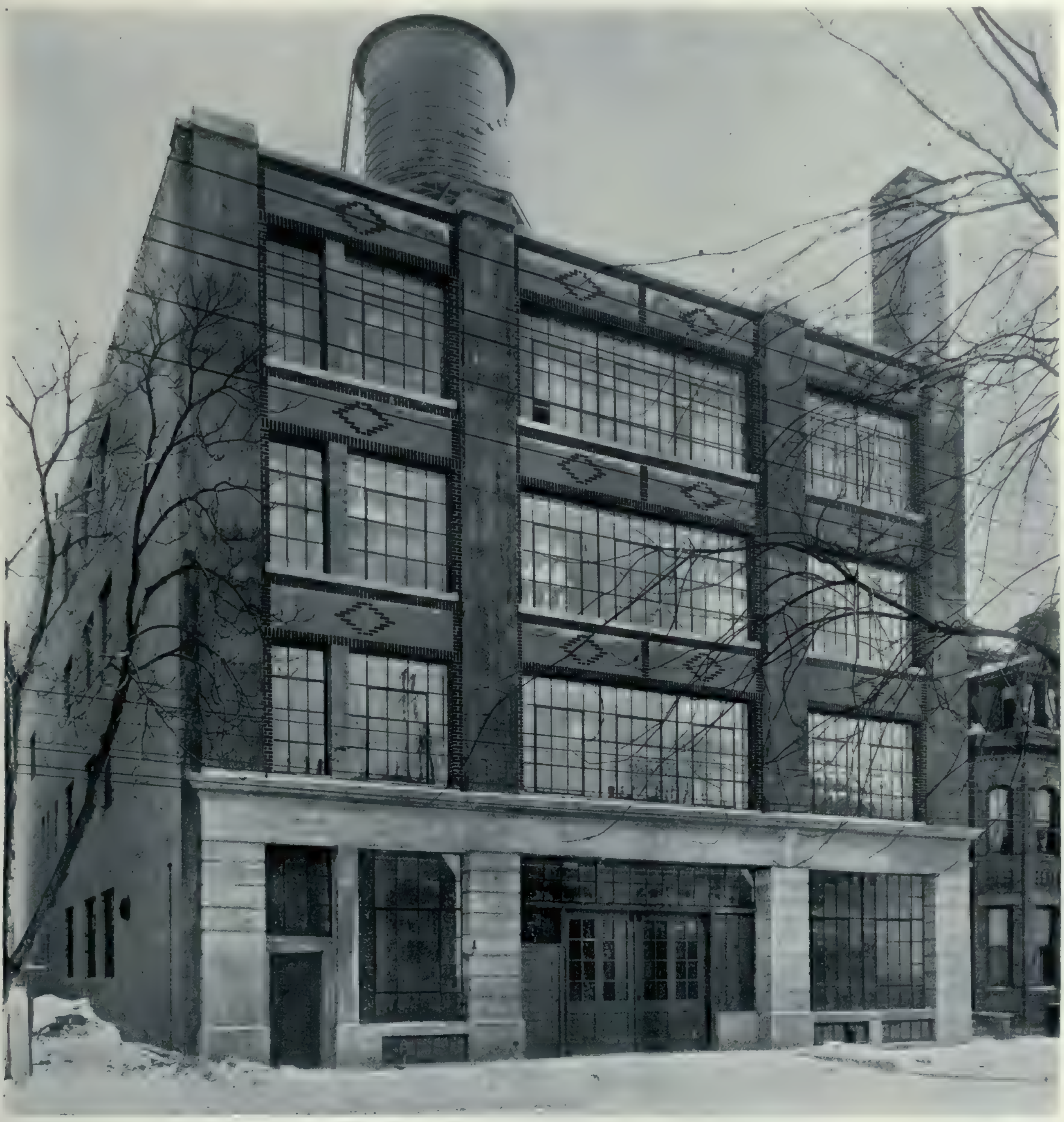
FIRST FLOOR PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.



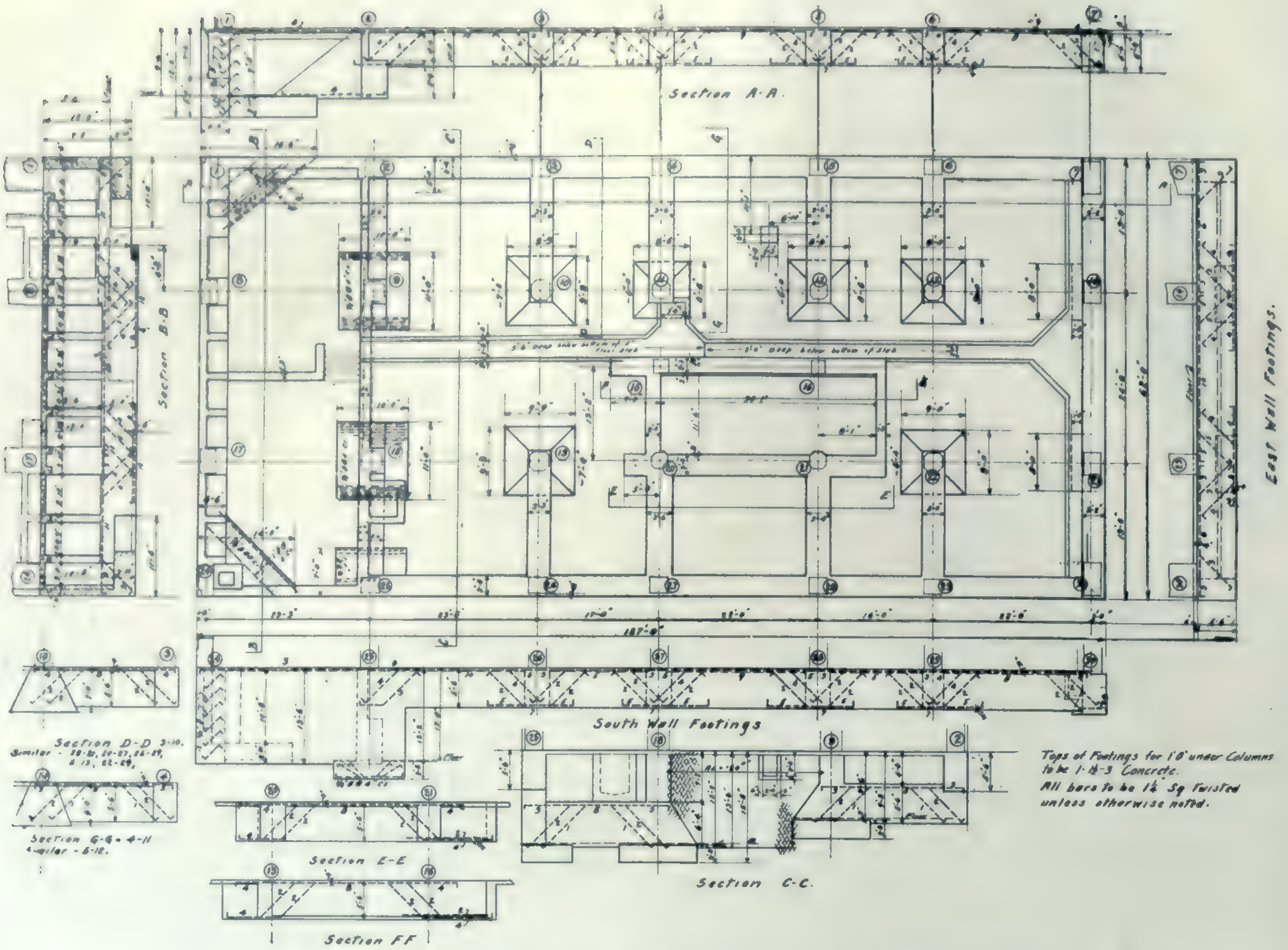
BASEMENT PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

past flush with the outside brick curtain wall, so that the columns and beams do not show on the side elevations. The spandrel walls of the office are built of interlocking tile, faced with brick on the outside, and plastered on the inside. The elevator pent house is also built of interlocking tile plastered both inside and outside. All interior partitions are built of eight-inch tile. Door frames are constructed of nine-inch steel channels between the office and the garage, and the doors are all three-ply tin-clad, except where kalameined doors have been used. All corners of partitions are protected with steel angles.

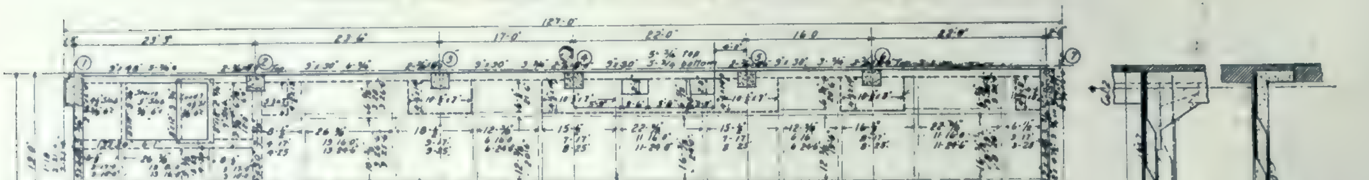
The reinforced concrete is of the flat slab type of construction, with two-way reinforcing. The largest panel is twenty-four feet square. The slab is nine inches thick, and the drop heads twelve inches thick, and eight feet square. The columns and footings are designed for two additional storeys, the present roof being the future fifth floor. The elevator pent house has been arranged so that the two additional storeys can be added, and the building completed without interfering with the operation of the elevator. The floors were finished as poured with a one-inch surface of concrete, composed of one part of cement to one and one-half of sand, and three of trap rock not exceeding three-eighths inch.



VIEW FROM SIMCOE STREET, GARAGE, AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.
HARKNESS & OXLEY, ENGINEERS. SHEPARD & CALVIN, CONSULTING ARCHITECTS.


Section A-A
Section B-B
East Wall Footings
South Wall Footings
Section D-D 3-10.
Similar - 20-16, 20-27, 26-29, 8-13, 22-29.
Section G-G - 4-11
Similar - 5-12.
Section E-E
Section FF
Section C-C
Tops of Footings for 1'6" under Columns to be 1-1½-3 Concrete.
All bars to be 1¼" Sq Twisted unless otherwise noted.
127'-0"

FOUNDATION PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.


127'-0"
23'3"
23'6"
17'0"
22'0"
16'0"
23'9"
5" Slab
¾" Finish
Section midway between Cols 1 and 2
Section on Center Line of Columns
Section on Center Line of Building
Elevation of Wall Beams
Col 8
Col 9
Col 10
Col 24
Col 25
Col 26
1 Size of Beams are given Width by Depth over all
2 On 3rd Floor extend drop ceiling from Column to Column to form 3 panels in Ceiling over Show Room
3 Stair well at North-west corner to be covered with Temporary slab at Roof
4 All Bars to be square twisted
5 False Beam between Cols 12 and 13 3rd Floor only
Revised March 31st Dimensions
Live Load Dec 5 1'73 14

TYPICAL FLOOR PLAN, REINFORCED CONCRETE, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

The foundations of the building are designed as continuous beams along the side walls, the eccentricity of the load being provided for by cantilever beams extending to the interior columns. The beams are of a uniform depth of five feet six inches. The unbalanced part of the load on the interior columns is carried by spread footings at the ends of the cantilever beams.

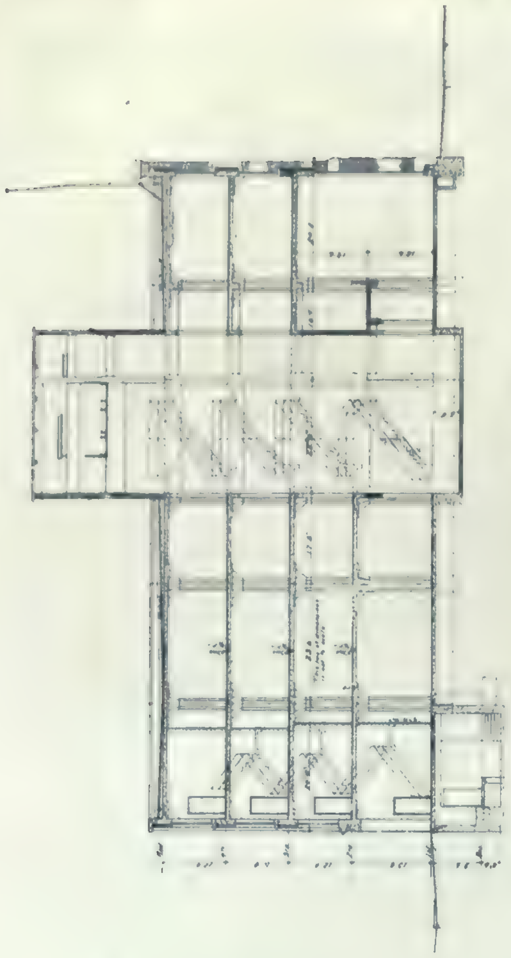
A large elevator is situated centrally in the building, the hall and stairs alongside occupying with the elevator the width of the outer bay. The showroom, about forty feet deep, is two storeys in

VIEW SHOWING OFFICE OVER SHOWROOM.

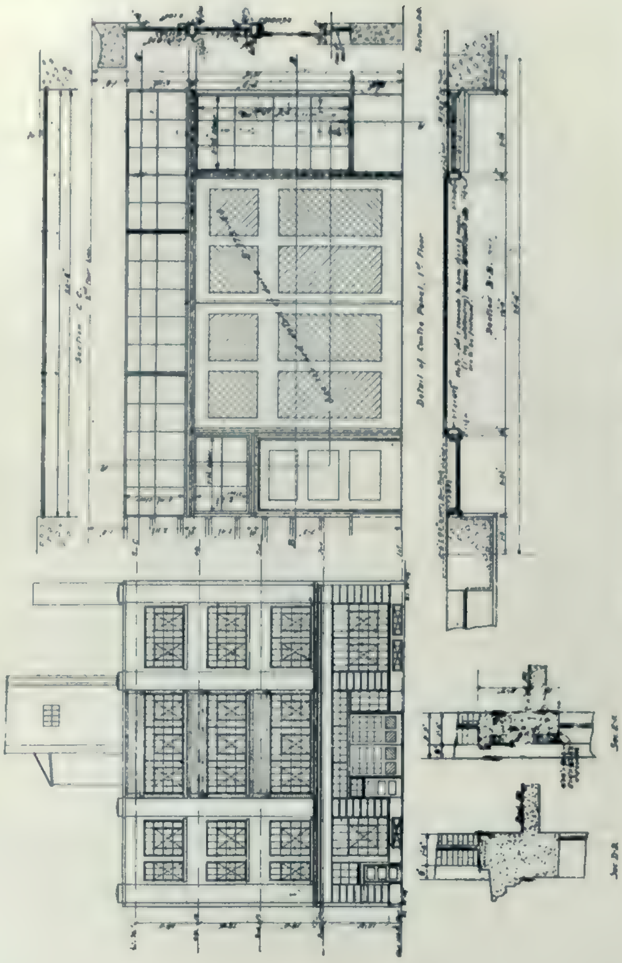
VIEW OF SHOWROOM AND OFFICE, GARAGE, AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.

HARKNESS & OXLEY, ENGINEERS.

SHEPARD & CALVIN, CONSULTING ARCHITECTS.



LONGITUDINAL SECTION.

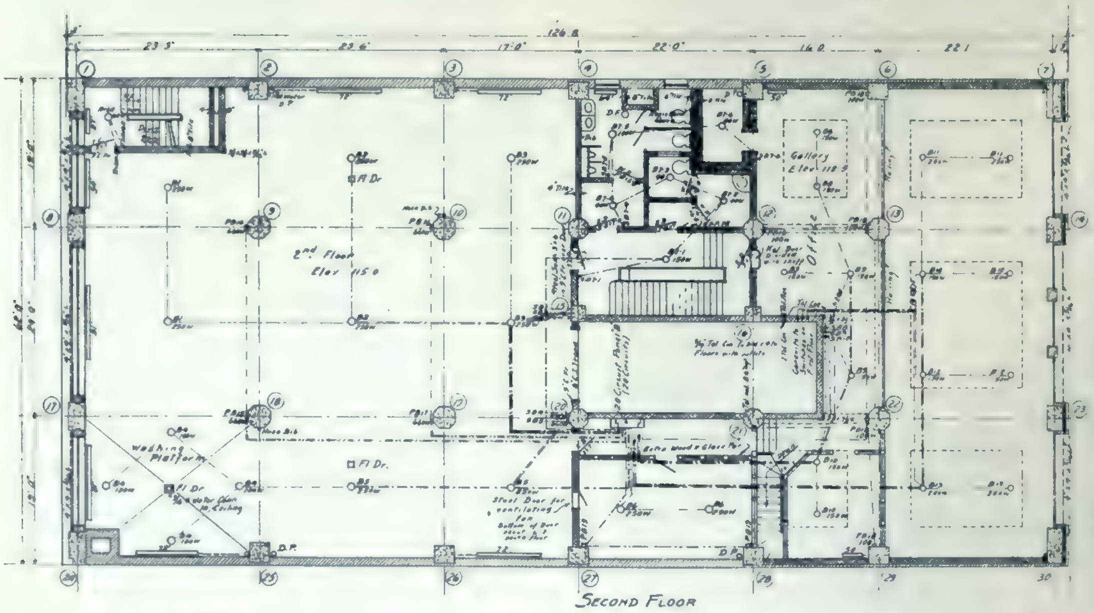


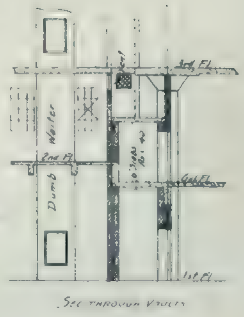
ELEVATION, SIMCOE STREET.

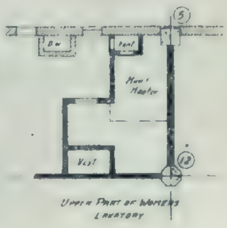
SHEPARD & CALVIN, CONSULTING ARCHITECTS.

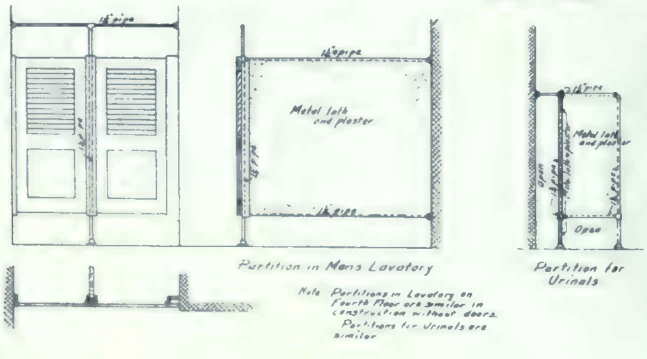
HARKNESS & ONLEY, ENGINEERS.

SECOND FLOOR PLAN, GARAGE, THE AUTOMOBILE AND SUPPLY CO., LTD., TORONTO, ONT.








Metal lath and plaster
Partition in Mens Lavatory
Partition for Urinals
Note Partitions in Lavatory on Fourth Floor are similar in construction without doors. Partitions for Urinals are similar

height, and faces University avenue. A gallery across the back of the showroom is used for office purposes. Access is had to the showroom for cars through the elevator, the entrance from University avenue being for pedestrians only. The garage entrance is from Simcoe street, and all service is supplied from this end. The basement, which occupies but one bay of the building, accommodates the boiler room, the oil storage room, and the air compressor rooms, as well as a lavatory for the male employees. The top floor of the building will be used as a machine shop.

The gasoline supply is stored in two five-hundred-gallon tanks situated between the building and the sidewalk on Simcoe street. The gasoline pump is situated just within the door, and is arranged so that gasoline may be drawn from either tank and discharged through hose either to a car outside or inside the building. The four oil pumps stand along the west wall north of the entrance. and draw oil from four fifty-gallon tanks in the oil storage room below. The compressed air equipment consists of two and one-half inch by three inch water cooled pump, with a capacity of from six to eight cubic feet per minute, operated by a three horse-power direct connected motor discharging into a thirty-six inch by eight inch tank. The pump starts automatically when the pressure in the tank drops to one hundred pounds per square inch, and stops when the pressure reaches one hundred and forty pounds. An air pipe leads up through the building with an outlet connection on each floor. This equipment also supplies air for tires, with one outside and one inside air hose connection. These tires are each fitted with a small air chamber, to one end of which the hose connection is made, and to the other end of which a pressure gauge is attached, so that the pressure of air being supplied to the tire can be seen directly on the gauge.

The elevator is perhaps the largest in Canada. It is ten feet wide by thirty feet long, and is designed to lift 10,000 pounds. It is fitted with the counterbalanced type of doors, mechanically operated and arranged so that a door cannot be opened at any floor except when the car is at that floor, and the car cannot leave the floor until the door is closed.

The building was designed by Harkness & Oxley, consulting engineers, and constructed under their supervision. Shepard & Calvin were consulting architects, and H. H. Angus electrical engineer.

Separate contracts were let for the different trades.

REINFORCING IN PLACE, TO RECEIVE CONCRETE.

◆

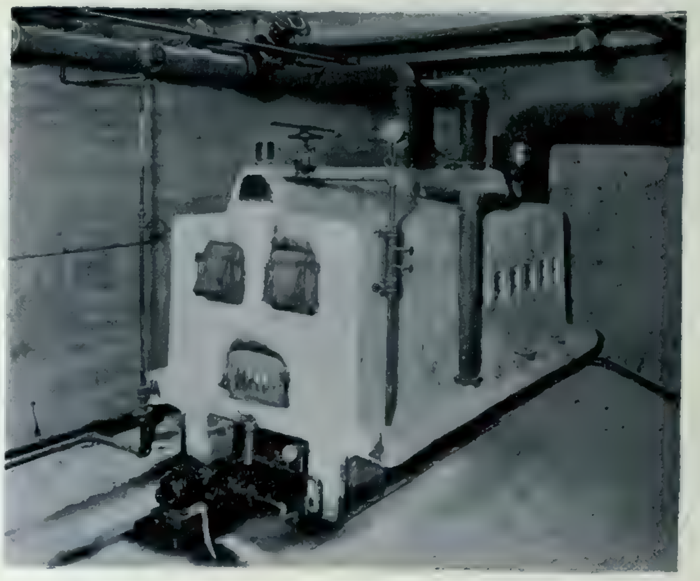
A New Pulp and Paper Mill in Manitoba

A pulp and paper mill, having a daily capacity of one hundred tons of paper, and employing about five hundred workmen, is being built at Grand Rapids, Manitoba, about two hundred and fifty miles northwest of Winnipeg. The

REINFORCING IN PLACE TO RECEIVE CONCRETE, LOOKING WEST.

VIEW OF TYPICAL FLOOR BEFORE FINISHING.

controlling interest is held by Winnipeg business men, who are holders of extensive timber lands in the vicinity of Grand Rapids, and anticipate the construction of a large sawmill in connection with the pulp and paper industry. The head office of the company will be located in Winnipeg, and the product of the mills shipped by water to Winnipeg. The work of construction will be begun in the early spring, but the completion of the plant will probably extend over a period of nearly two years.



BOILER ROOM, SHOWING OIL BURNER.

VIEW, TYPICAL FLOOR.

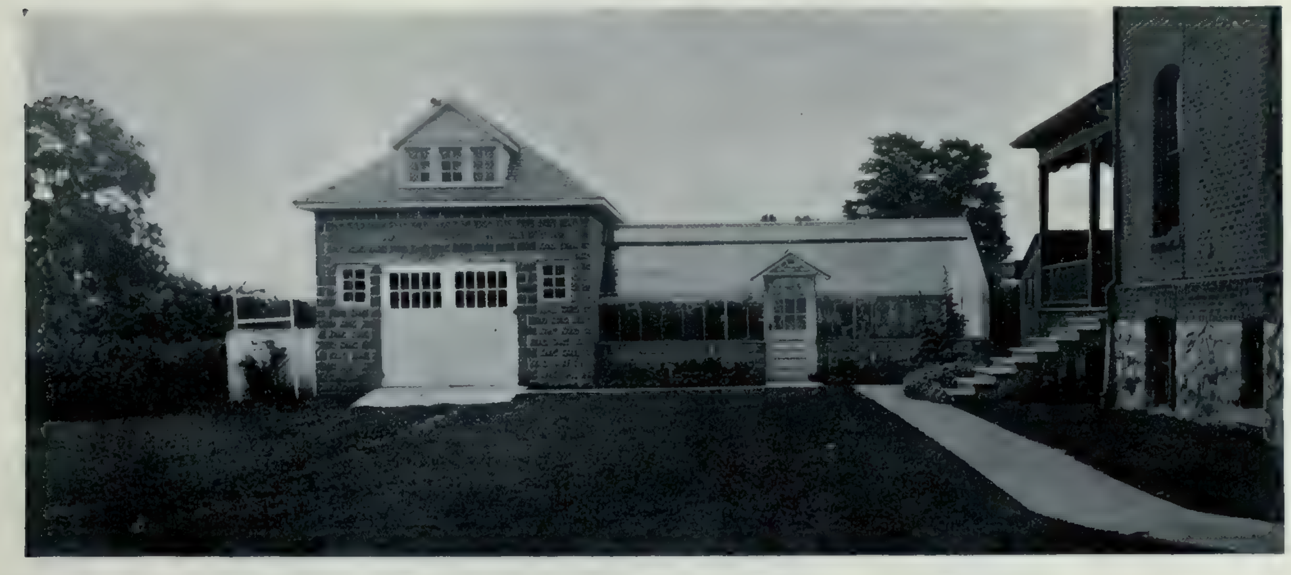
The Lumbering Industry of The Prairie Provinces

Although the prairie provinces are usually associated with but one pursuit, namely, farming, the forested portions give rise to a lumbering industry of importance, and, while inferior in development to those of British Columbia or the eastern provinces, are of great value to the immigrant settlement in the west. In 1913 some 188 mills in Manitoba, Saskatchewan and Alberta sawed approximately 250 million feet of lumber, valued at the point of manufacture at over $4,260,000. Of this quantity, Saskatchewan forests produced approximately two-thirds, Alberta one-fifth, and Manitoba the balance. The prairie market consumed about 1,434 million feet of lumber annually. Over one-half of this comes from British Columbia (in part from the Railway Belt portion), and the remainder is supplied from north-western Ontario, the United States, and the home forests.—*Forest Protection in Canada,* 1913-1914.

Two Worthy Greenhouse-Garage Problems

WHEN your editor first asked me to write this article I shook my head. Shook it, because having so much to do with the actual construction side of greenhouses, was afraid it would just naturally influence me to put too much stress on that side. But last week, after having had two rather "tusseling times" with two of your profession, am now welcoming this opportunity.

Am going to tell you exactly what our points of difference were, thinking they might be of special interest to you in any greenhouse work you may have in hand.



GARAGE AND GREENHOUSE, ERECTED FOR MRS. J. E. GORDON, WALLACEBURG, ONT., BY LORD & BURNHAM CO., LTD.

In the case of number one the garage was still on paper.

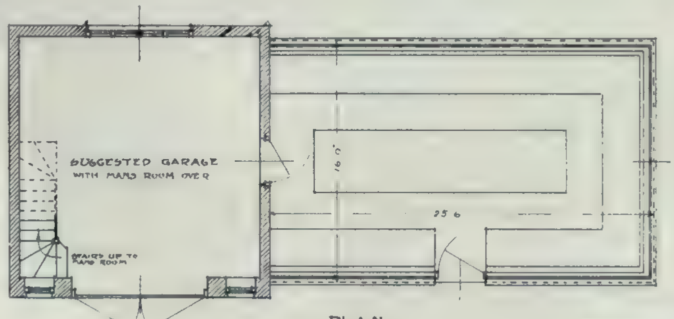
The location conditions, or even the fancies of the owner, did not proscribe that the point of greenhouse attachment should be on the eastern eave's side, where the roof snow and ice would tumble on the greenhouse and break the glass; not to mention perhaps, freezing the plants before repairs could be made.

There was the available southern side—an ideal exposure—but the plan called for the side entrance of the greenhouse being the termination of a certain walk, which, if not so carried out, would "spoil the balance," or "the axis," or something.

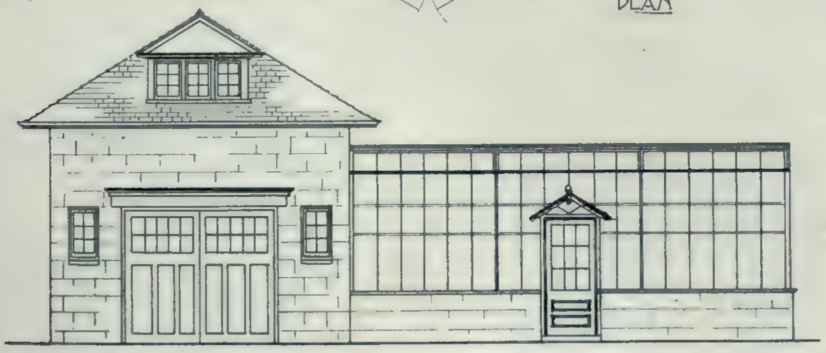
Of course, the roof could be protected with a snow screen guard; but why spoil the graceful lines of its roof by making it look like some kind of a huge trap—an unsightly thing the year about? Not only unsightly, but a beautiful thing to form a shade blanket, shutting out the light at the time of all times of the year when plants most need all possible light and sunshine.

It is, however, going to be built just as originally planned, and so it is that practicalness is being sacrificed to "axis."

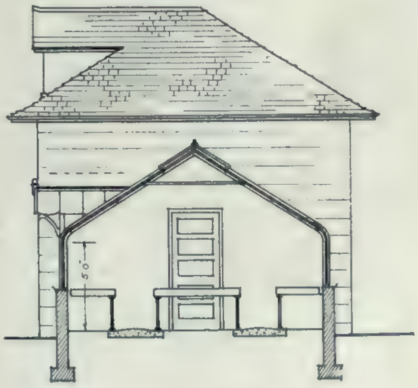
Instance number two had to do with the heating.



PLAN



SIDE ELEVATION



SECTION

In this case the garage was already erected, but the heating contract not yet let.

The greenhouse was an after-thought, and its location was right in every particular.

But the architect insisted on steam heat, in spite of the fact that we pointed out that in its fierce heat flowers did not thrive as with the equableness of hot water.

He claimed that if steam was good for the big rose houses fifty feet wide and hundreds of feet long, it was good for the one twenty-five by fifty feet.

He refused to see that in those big houses there is such a large mass of air above the plants that because of better ventilating conditions, it takes the "fierceness" out of the heat.

He refused to recognize that although steam is quicker to respond, it also cools down more quickly. It has none of the latent heat of hot water to act as a fortifying factor against sudden outside changes.

Were the specifications changed to hot water?

No.

Both garage and greenhouse will be steam heated.

As near as I can make out the architect and the manufacturer need to get a good bit closer. Both, maybe, are taking themselves a bit too seriously.

The manufacturer may be putting too much emphasis on the practical. The architect too much on "axis." Why not a ground somewhere between each, to the ultimate greater advantage of each, and the broader, more sincere service to the client?

GARAGE AND GREENHOUSE, ERECTED FOR MR. J. D. CHAPLIN, ST. CATHARINES, ONT., BY LORD & BURNHAM CO., LTD. BECAUSE OF ITS COMPACTNESS AND ECONOMY IT PROVES A GOOD COMBINATION. HEATING OF BOTH IS ACCOMPLISHED BY THE USE OF ONE BOILER, SITUATED UNDER THE GREENHOUSE.

◆

French Supplies of Reconstruction Materials

The French Minister of the Interior has just published the results of an investigation made under his direction concerning the supplies of building materials likely to be available for reconstruction work in France upon the conclusion of peace. Among the materials thought to be available in sufficient quantities are stone, brick, sand, cement, tile, building hardware, wallpaper, and certain others of minor importance. It is believed that for lime, iron pipe, street-paving materials, and sandstone French production may be increased to a point that will meet the demands. In the groups of materials in which a shortage may be felt are plaster, timber and lumber, slate, structural iron and steel, heavy hardware, tin, zinc, lead, plumbing supplies, pumps, sanitary appliances, heating apparatus, paint, and glass of all sorts.

It is reported by the Government that the necessary steps will be taken promptly to encourage the larger production of those materials of which there will undoubtedly be a very considerable need as soon as building operations are resumed on a large scale. These measures consist mainly of: The provision of facilities for obtaining the necessary equipment for producing building material; the resumption of operations in plants that were shut down; the resumption of the exploitation of mines and quarries; the reopening and improved equipment of brickyards, tile works, and establishments engaged in the manufacture of lime and cement and other basic building materials; finally the adoption of measures to increase the supply of labor. It is, furthermore, stated by the Government that every effort will be made to have the work of reconstruction undertaken as far as possible by local concerns. It is, of course, generally understood that the Government will give financial assistance to all manner of reconstruction work in the devastated regions of France.

◆

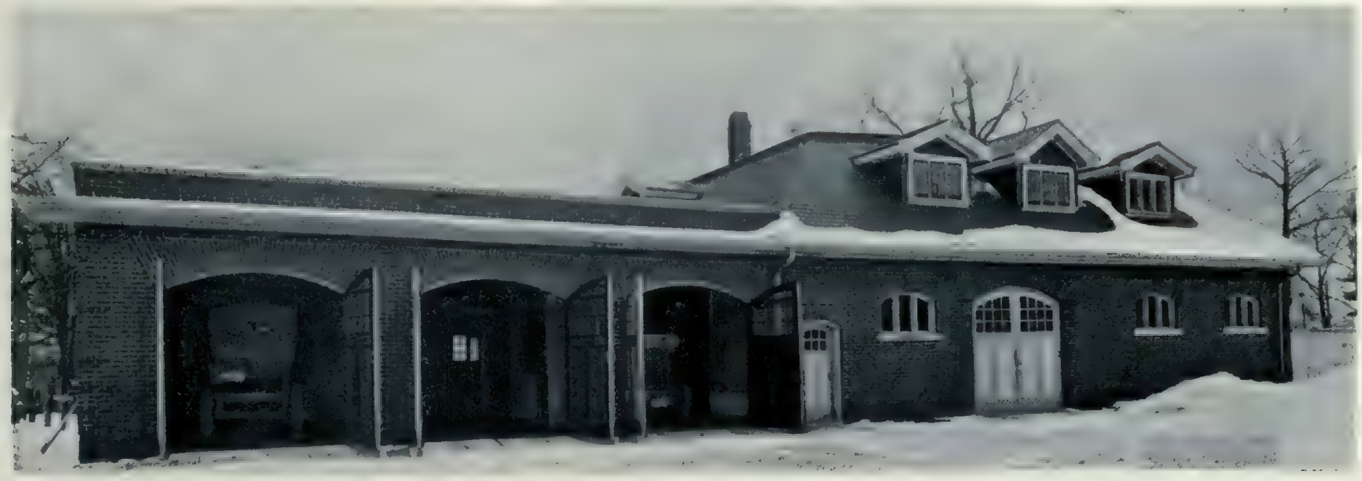
English Architects Donate Old Tracings for Surgical Bandages

In a recent issue of "Building News," of London, it is pointed out to draftsmen that one of the many minor ways to help in these times of war is in the collection of old linen tracings.

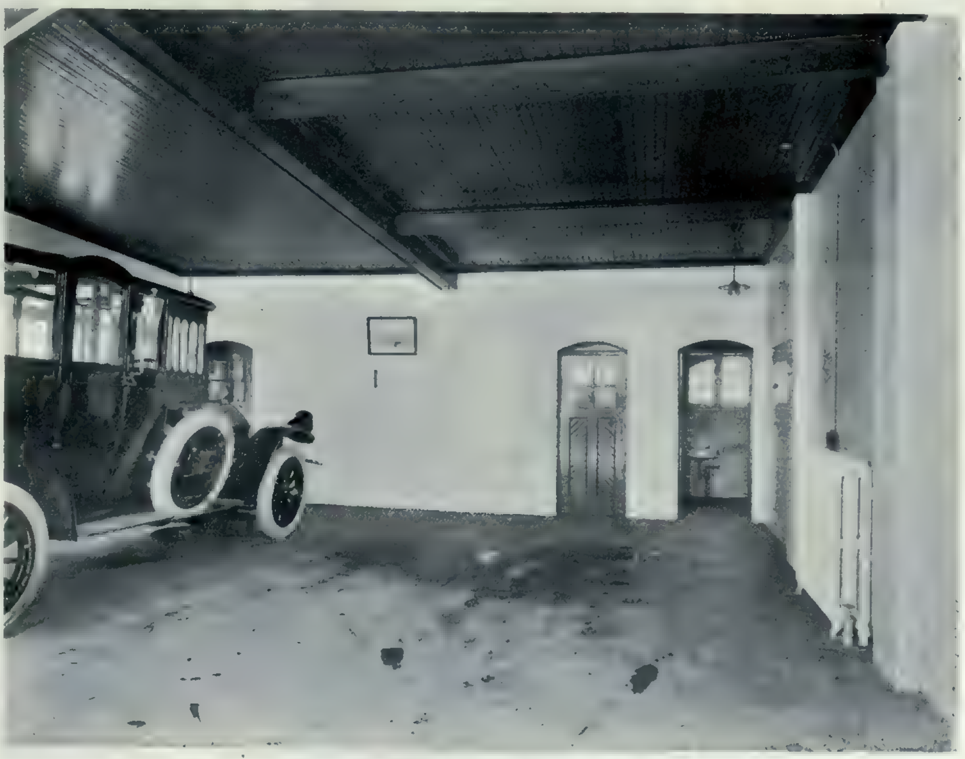
The article states: The cloth, when boiled, washed and sterilized, makes excellent bandages, pillow cases, etc., for the wounded—things that are still bady needed. Engineers need have no fear that their designs will be copied, because all the tracings are handed to a responsible person to be treated. There are few works that do not destroy dozens of yards of tracing linen a year, and now that this excellent use for the waste material is pointed out to them we feel sure they will respond.

A Three Car Garage, Toronto, Ont.

THE outstanding feature of this garage is the brightness of the interior, the inside walls being lined with white enamelled brick and the ceilings sheeted with Georgia pine. The floors are of slab concrete construction laid on a cinder bed three inches thick, and have a slight grade to trap in centre of floor. The washroom floor has a grade to edge of wash rack, and then a three-quarter inch fall to trap in centre of rack. The heating apparatus is a hot water system, which maintains a temperature of seventy degrees if necessary at zero weather. The oil and gasoline storage equipment is modern, the pumps being situated in the washroom, and are easily accessible near the entrance. Three sets of swing doors provide entrance to each car rack, and are so situated as not to interfere if all should be opened at once. At the rear of car space is located a washroom with shower attachment; also the workroom and tool storeroom.



GARAGE, ROBERT DAVIES, TORONTO, ONT. BURGESS & MARCHINGTON, ARCHITECTS.

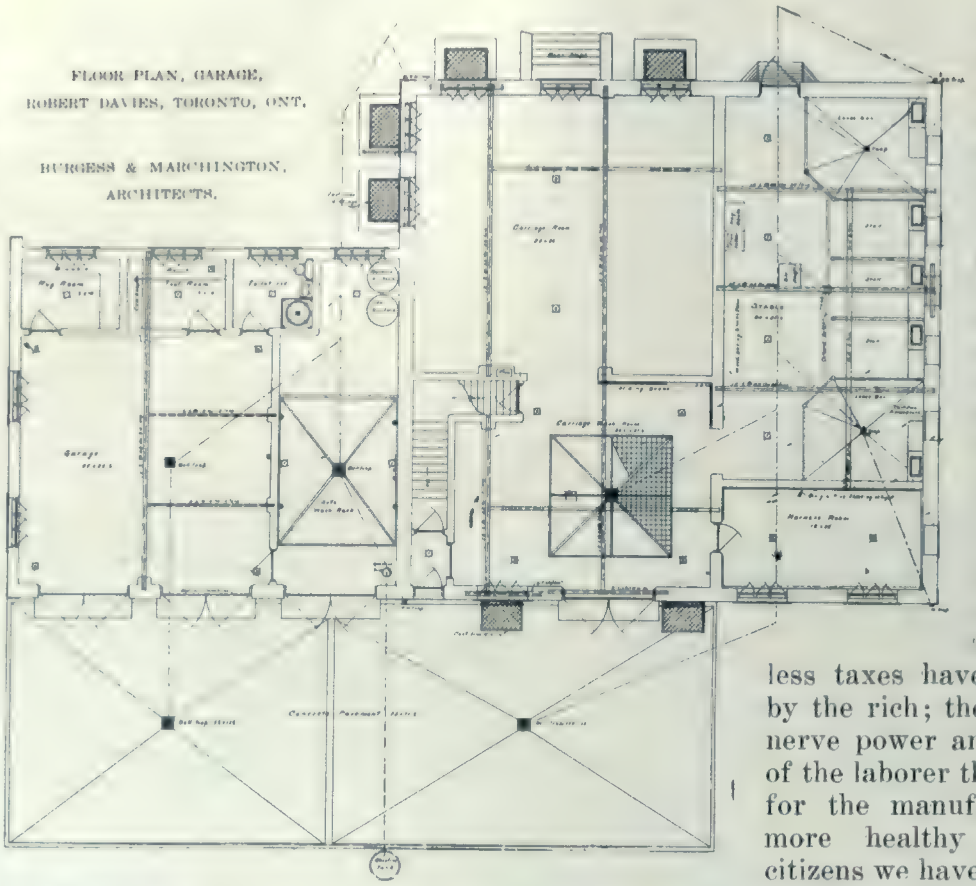


VIEW OF CAR SPACE, SHOWING ENAMELED WALLS AND BEAMED CEILING.

Housing Conditions in Canada

Surely the poorest and meanest citizens of any country are entitled to decent and sanitary shelter. This should not be withheld from them because of misfortune or inefficiency. Neglect of the conditions in which many people have to live is often excused on the ground that they themselves are responsible, even though it is not them, but their children, whose health and moral upbringing is of such value to their country, who are the chief sufferers from the neglect. But these excuses are most frequently offered by those who profit from existing bad conditions, and whose minds have become warped by that fact. People soon become degraded by bad conditions, and it is easy to point the finger of scorn at them and say they are responsible for their surroundings. After we have permitted them to become degraded, after we have allowed dwellings to be erected in which their sense of decency cannot be kept, we organize educational campaigns and preach at them and expect them to respond. At great cost we provide schools for their children, thinking that we can properly train young minds in bodies diseased and stunted by lack of air and clean surroundings. At further expenditure we provide hospitals and asylums, to correct mischief, much of which might have been prevented by proper building by-laws. Our factories and workshops want, meanwhile, efficient and mentally alert men, and the country loses in the sum of its physical strength, intelligence and spiritual force.

Why is it all necessary? The better buildings we erect the better it is for the builders; the more land we occupy with homes and gardens the better it is for the real estate owners; the less danger of fire the better it is for the insurers; the higher the standard of living of the poor the less taxes have to be paid by the rich; the greater the nerve power and endurance of the laborer the better it is for the manufacturer; the more healthy and clean citizens we have the better it is for the country. Let us build for the future, passing up the errors of the past.

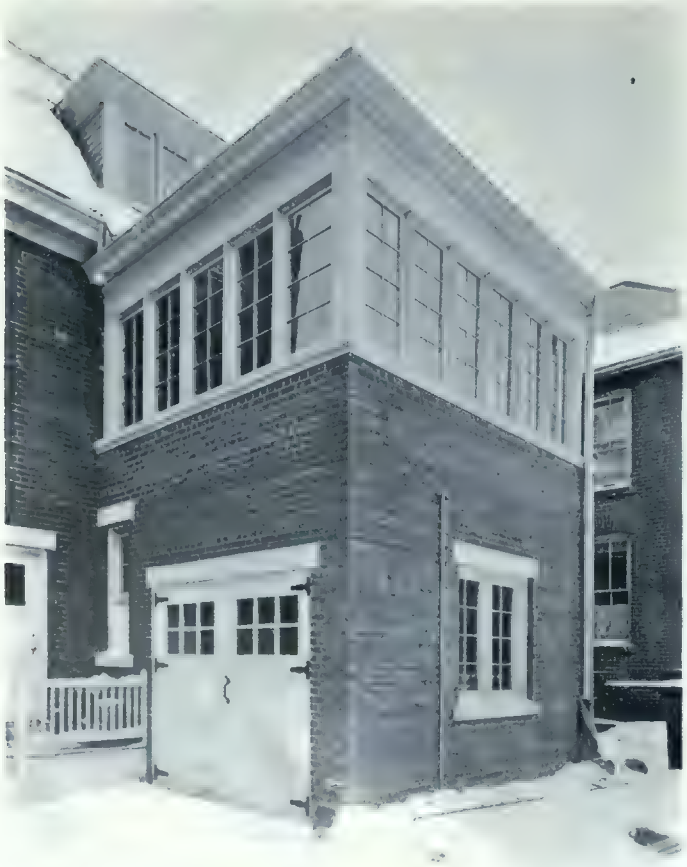


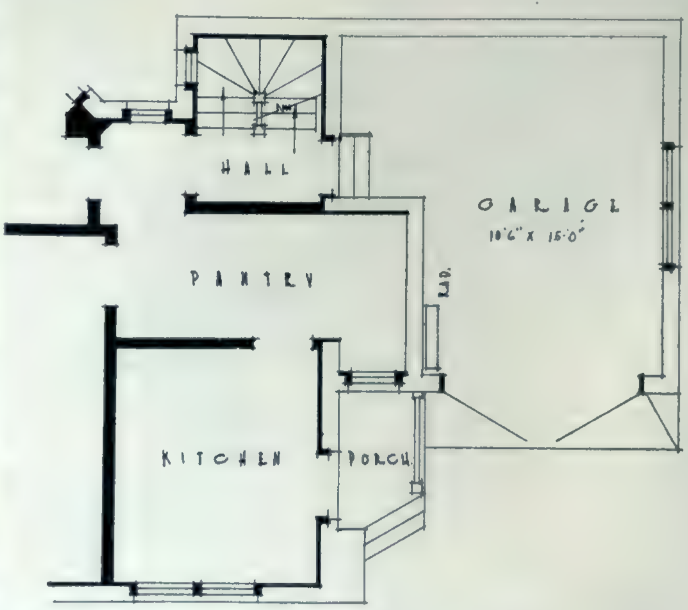
FLOOR PLAN, GARAGE,
ROBERT DAVIES, TORONTO, ONT.

BURGESS & MARCHINGTON,
ARCHITECTS.

A Desirable Garage Design, Toronto, Ont.

An economical design, affording ample facilities to the owner who cares for his own car. Dimensions sufficient for a car of any size. Easy access to house is provided, and yet distinctly a separate structure. The upper storey provides a sun room and adds to the exterior appearance.





GARAGE, TORONTO, ONT. HYNES, FELDMAN & WATSON, ARCHITECTS.

Garage on St. George Street, Toronto, Ont.

COMPLETE equipment and utilization of overhead space are features of this garage. Space for six cars has been provided. Entrance from the street is obtained by a concrete roadway leading into a paved court, which affords ample room for turning. The building is of red pressed brick, and the car space and wash room are lined throughout with white enameled brick. A glass garden extending from the southern end of the garage provides entrance to the house. Access to the rug room, workroom and storeroom is had from the main car room. The upper storey is equipped as a billiard room, an inglenook with fireplace helping to provide a cheery atmosphere. The servants' quarters are also on this floor. The building is heated by steam from the plant located in the basement.

GARAGE, GEO. H. GOODERHAM, TORONTO, ONT. GEO. W. GOUINLOCK, ARCHITECT.

◆

The Treatment of Sewage

The necessity for proper treatment and disposal of sewage cannot be too strongly emphasized in Canada. Many municipalities have been very active along these lines, but unfortunately a greater percentage have been extremely negligent. The result of this, as shown in a report on "Water Works and Sewerage Systems in Canada," recently issued by the Commission of Conservation, is that more than sixty of our inland water systems are at present receiving raw sewage, one hundred and eighty municipalities contributing to this very undesirable condition. The practice of treating sewage is being recognized as imperative throughout the civilized world, and would possibly spread more rapidly throughout Canada were some of its economic aspects better known. Recent experiments have been made in this connection to determine the feasibility of a new process to extract grease and fertilizer base from sewage.

WASHROOM, OIL AND GASOLINE PUMP.

Ordinary sewage sludge from settling basins is greasy, offensive and of so little practical value that farmers will not accept it for fertilizer, even as a gift; yet this sludge contains valuable fertilizing elements and considerable grease. The settling of the sludge and the extraction of the grease is facilitated by the addition of certain chemicals, and the process is found to possess the following advantages:

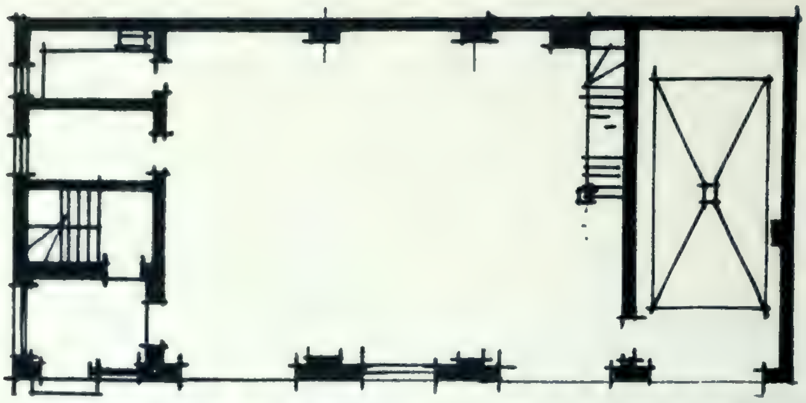
1. The chemical treatment practically pays for itself by the sale of grease and fertilizer recovered.
2. The sewage is disinfected.
3. The chemical acts as a strong deodorizer and prevents the nuisance of treatment works.
4. The fly nuisance is also avoided for the same reason.

The process has been thoroughly investigated and tested, with results that seem to indicate that it will not only be successful, but profitable.

Architectural Training

Scholastic training in architecture is a comparatively modern idea. With our present widespread facilities for college training in the arts and sciences it is difficult for us to keep in mind that the architectural school is essentially a creation of the past century, and that no such facilities for study were accessible to ancient architects or those of Renaissance days. The great centres of continental Europe in the days of the Renaissance, Paris, Padua and Salamanca, with their splendid universities dating back to mediæval times, says the "American Architect," had no place for the architectural student, and the traditions of architecture were transmitted from master to pupil by personal association. In those days it scarcely merited the name of profession in the same sense as did the law or medicine, nor was it considered worthy of being studied in similar institutions.

MAIN CAR ROOM.


GROUND PLAN, GARAGE, GEO. H. GOODERHAM. GEO. W. GOUINLOCK, ARCHITECT.

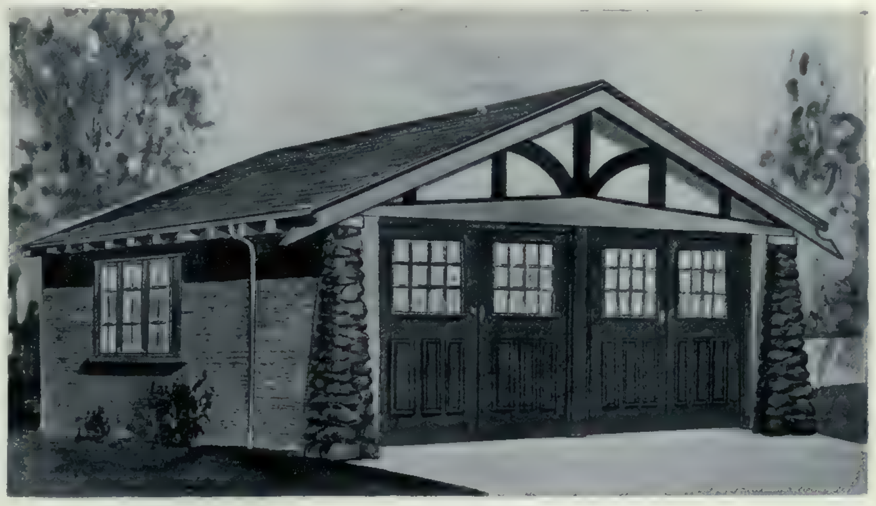
Our present systems of collegiate training in the profession of architecture are based upon the idea of forming the young and undeveloped mind along broad and sane lines. Cultural courses and supplementary studies form quite as important a part of the work as the study of pure design, and the work of our modern architects is characterized by a sophistication that can be directly traced to the broadening influences of the college.

It may be questioned, however, whether or not in this system of education the attention paid to breadth of view does not sacrifice that high sincerity in architecture which is, after all, necessary for the production of really great works of art. There is in the busy classes of a modern architectural school little of the close personal relationship between master and pupil that developed the great architects of the Renaissance—a relationship that must have fostered and transmittted from one generation to the next the idealism of architecture. The type of architect to whom the production of sincere and beautiful buildings is of supreme importance and the economic profit a mere incident is unfortunately greatly in the minority in America. We are, as a class, too prone to accept the practical limitations put upon our art and to erect buildings that are compromises at best, rather than structures that represent our utmost of artistic ability.

BILLIARD ROOM OVER GARAGE.

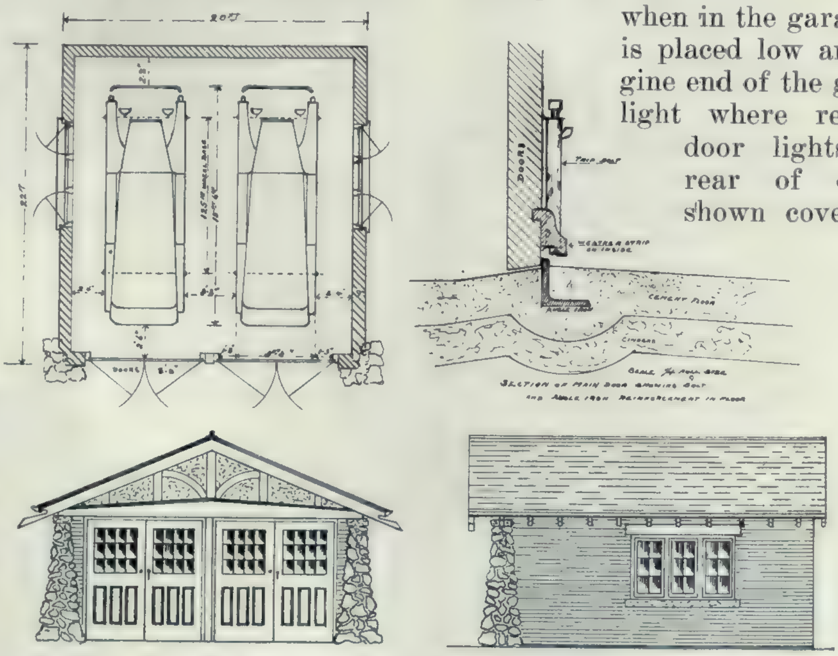
Residential Garages at Toronto, Ont.

THERE are many points to consider in the design and construction of small motor garages, and this type of building is probably the most important of any of the outbuildings erected in connection with ordinary domestic usage. The demand for garages has increased proportionately with the increase of motor car owners. A house can be immeasurably improved by the addition of a garage correct in architectural design, and also from the standpoint of safety. In spite of the latter fact, however, it will often be found that an expensive car is housed in a cheap and unsuitable building, and in many cases this is due to the lack of foresight and experience on the part of the owner, rather than to any deliberate attempt to save a few dollars to the detriment of the building itself. If the obvious advantage of a suitable structure which need not necessarily be expensive, were clearly set down before the average motor car owner, it is quite certain he would not be prepared to run the risks of a combustible or temporary building, and the result would be that garages would be built on better lines. The average residential garage is but a small building, and the amount involved is very often out of proportion to the remuneration, and if sufficient interest is not shown, naturally the garage suffers. In view of this, contractors specializing in garage construction are offering their services to architects. The problems which arise are frequently greater than appear at first sight. The main door troubles are numerous; and in heating, while the modern adaptation of electricity, gas and hot water are making each more feasible, yet there is considerable to consider in each. The chief points in connection with every garage may be stated as follows: (1) Site; (2) dimensions; (3) materials of construction and finishing; (4) storage of oils and gasoline; (5) lighting and heating (6) ventilation. The accompanying examples located in Toronto show to an extent the progress made in residential garage construction.

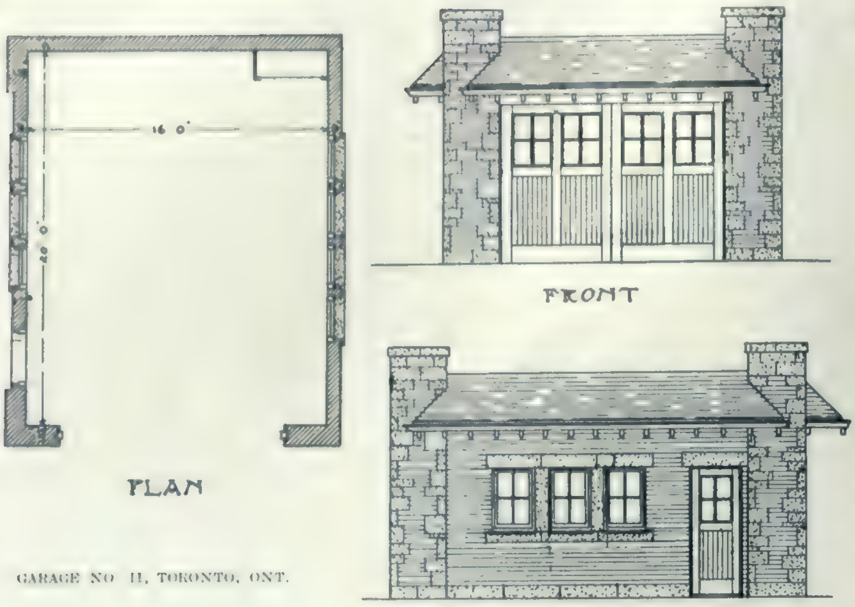


GARAGE NO. I, TORONTO, ONT.

Garage No. 1 shows a Hurndall garage of cobblestone and brick combination, twenty by twenty-two feet outside, with plan for two cars standing in position after entering garage, giving surrounding measurements with front bumper and cover down, car base being taken at one hundred and twenty-five inches, the maximum for comfort in this size garage. The clear door space is seven feet ten inches, and it will be noted that a wood post is substituted between the doors in place of a brick pier, allowing the cars to be driven closer together when in the garage. The side light is placed low and towards the engine end of the garage, giving most light where required, the front door lights taking care of rear of car. The section shown covers the main door construction at the floor, the novelty of this being the weather strip on inside of the doors, the metal reinforcement in the floor forms serving to shut against, but difficulty has arisen, due to sweating on inside,



ELEVATION AND PLANS, GARAGE NO. I, TORONTO, ONT.



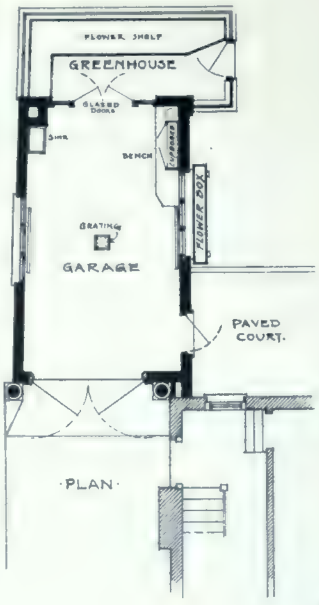
GARAGE NO. II, TORONTO, ONT.

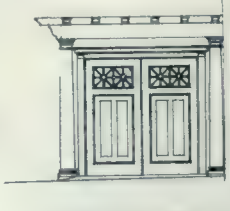
which in winter will freeze. This is eliminated thereby.

Garage No. 2.—This is a combination of brick and stone, the feature of this design being width of front doors, with a view to accommodating one's friend who calls, or owner's second car, in close quarters. It will be found by running the first car to enter, forward on left side, there is ample room to drive a second car in on the right.

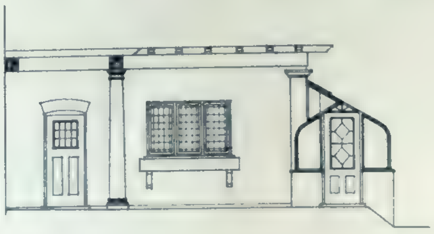
Garage No. 3.—In this plan the glass garden is situated at the rear of the garage. The garage is linked up with the house at right front corner; the pergoda at rear of house is continued round the garage, and side entrance from rear of house is provided. The individual hot water system is contained in basement under conservatory, which heats the same, and also provides hot water in garage for washing purposes. Underground conduits from house carry water and light mains to the garage.

Garage No. 4.—The exterior of this garage has been constructed entirely of grey stone, the interior being veneered with brick. While typically a two-car garage, it has been furnished with three sets of swinging doors, and has space enough to comfortably house three cars. The cement floor has been provided with traps for drainage, and the ceiling has trap doors, through which the car tops may be hoisted when necessary. The roof is of peculiar design, owing to a desire being expressed to protect the trees on each side of the building.





·FRONT ELEVATION·



WEST ELEVATION·

·GARAGE·AT·69·ROXBOROUGH·DRIVE·

DURKE·HORWOOD·&·WHITE·
ARCHITECTS·

GARAGE NO. III, TORONTO, ONT.

Metric System and Exchange in Different Countries

By Emile E. Delay, E.D.P.,
Architecte Diploma Par le Gouvernement Francais.

In order to bring about a solution of one of the great problems which will arise after the war between the Allies, who will want to have industrial and commercial relations with a basis at once normal, simple and uniform, facilitating the exchanges and transactions, it will be an imperative necessity to regulate the unity of exchange in order to avoid the present complications arising out of the systems in vogue relative to weights and measures and currency values, which in some certain cases are a source of grievous difficulty, and hinder progress. Progress doubtless is hindered by the fact of involuntary errors which the present systems are impotent to avoid; these errors occasion the loss of time, energy and money, also occasion oftentimes legal complications followed by mutual fault-finding, and all this without any profit to the interested parties. And why? Because there is no one possessing sufficiently robust initiative to cut the Gordian knot, to break ancient customs which have served their purpose, but which have become obsolete relative to the modifications which progress has brought about in this immense arena of international, commercial and industrial exchange.

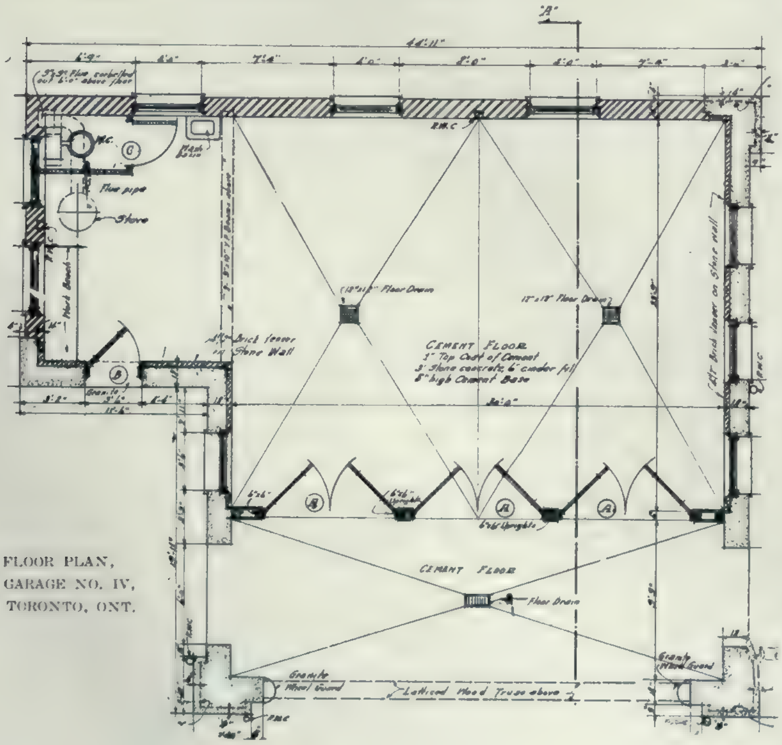
For years we have co-ordinated on the postal, telegraphic and telephonic exchanges in international transportation. We have unified and systematized wherever necessity compelled us, and this, I must say, for the greater good

GARAGE NO. IV, TORONTO, ONT.

of the world at large, whilst we have been insensible of the advantages that the metric system could afford, especially amongst the producing countries, among which England and her colonies stand out pre-eminently.

It must be admitted, and this without fear of contradiction, that the march of progress during the last quarter of a century has made giant strides, bringing with it a multitude of necessities not thought of before, but which have all turned out to be very satisfactory; and here it appears to me almost incomprehensible that this question of weights and measures and values has remained stationary, whilst others, not half so important, have been assimilated. There is then an inexplicable phenomenon, and so at the outset it is with a sincere conviction that my efforts will not be limited to mere theatrical effect, but that they will result in some practical system of understanding regarding this question, that I make these suggestions to bring about a practical solution. This can be accomplished later through the educational effects in practice of the very acts of public life in England and her colonies, which will have a part, I hope, after demonstrating to the world what they are capable of in the military domain, that they are not behind in adapting and assimilating progress, especially where their Allies and international friends are concerned, and where the greater prosperity of economic industrial and commercial exchange is concerned. In the vast realms comprised within the British Empire, I have often heard some stupid people taking a particular pleasure in lengthy conversations without foundation and reason that "everything was for the best in the best of all possible worlds." Also, as stated in my article appearing in "The Leader" under date of September 30th, it is not to these people nor to the arresters of progress that I am addressing myself, but more to those people who feel the necessity of avoiding shoals and reefs which are already very numerous in the matter of international exchange.

The metre is the unit of measure which appears to be most rational, as a fundamental unit. It is equal to the ten-millionth part of the quarter of the terrestrial meridian, or 0′ .39400″. Before the establishment of the metric system in France, there existed no uniformity in the different weights and measures in common vogue. This state of things presented grave inconvenience. Bordering districts were commercially isolated. In 1790 a decree of the Assembly charged the Academy of Science to organize a better national system. It was necessary to determine a unit of measure which would be basic for all others, and that this unit for the future would be basic and unalterable. It was decided to take it from nature itself. The academicians Mechain and Delambre were accordingly chosen to measure the length of the quarter of the terrestrial meridian, the

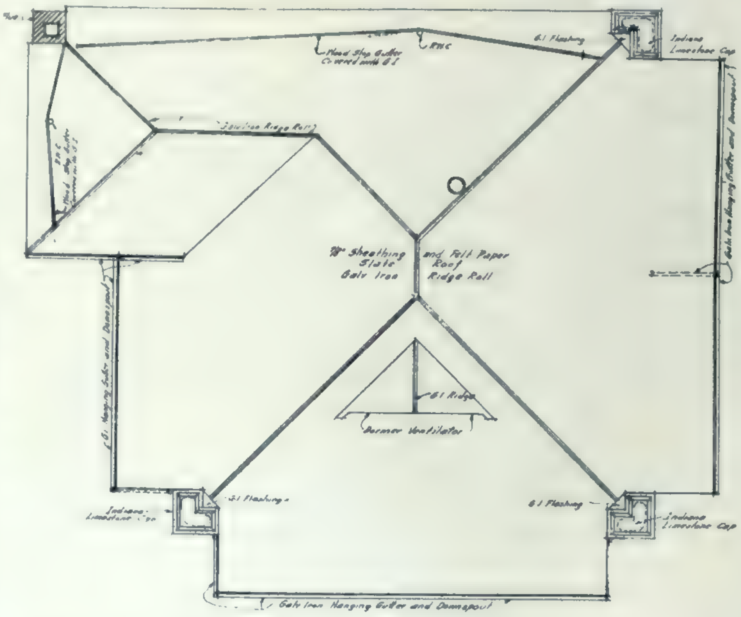


FLOOR PLAN, GARAGE NO. IV, TORONTO, ONT.

ten-millionth part of this length was taken as the unit of measure and received the name of metre.

The establishment of this system was one of the most useful aids to humanity. Switzerland, Italy, Belgium, and Spain, etc., adopted it, and to me it seems indispensable that England and her colonies must follow this example if they do not wish to expose themselves to commercial and industrial isolation.

To measure distances, we have the metre, which is divided into one hundred centimetres. The centimetre, which is divided into ten millimetres. We must then have one thousand millimetres or one hundred centimetres to make one metre. Ten metres are called decametre. One hundred metres are called hectometres. One thousand metres are called one kilometre. Ten thousand metres are called a myriametre. The measure of distance is expressed by placing the figure 1 or the letter L (linear), as, for instance, 100^{L}.



GARAGE NO. IV, TORONTO, ONT.

To measure agricultural surfaces, we have the centiare. The one hundredth part of the are, which is equal to one metre square. The are is a decimetre squared, or one hundred square metres. The hectare or the hectometre squared, or one hundred ares. The surfaces in metres are expressed by placing the figure 2 to the side, as, for example, $100\ M^2$, because the square takes two measurements.

In measuring cubes, we have the cubic metre, a solid body with six equal surfaces one metre in length each, the cube equals one million centimetres cubed or one thousand decimetres cubed. The cubic units are expressed in cubic metres such as 1^3, 100^3, $1{,}000^3$ cubic metres, because the cube takes three measurements. As regards the unity for capacity, we have the litre, which contains one cubic decimetre, the litre is divided into ten decilitres, one hundred centilitres, one thousand millilitres. Ten litres are called a decalitre, one hundred litres a hectolitre. Larger quantities are expressed as one hectolitre, ten hectolitres, or one kilolitre, and after we tell twenty, fifty, one hundred, one thousand, ten thousand hectolitres.

A litre of distilled water at five degrees centigrade weighs one kilogram. For the weights, we have the kilogram, which is subdivided into one thousand grams. Ten grams are called a decagram. The one hundredth part of a gram is called a centigram, the one thousandth part of a gram is called a milligram. One hundred grams are called a hectogram. The quantities larger than a kilogram are expressed as follows: one hundred kilograms are called a metric quintal, one thousand kilograms a metric ton or tonneau.

To measure the temperature we have a thermometer called centigrade, which, when at zero, indicates the moment when water freezes.

To express monetary value, we have the following coins: a centime and two centimes in copper; five, ten, twenty, twenty-five centimes in nickel; fifty centimes, one franc, two francs in silver; five francs in silver or gold; ten, twenty, fifty, and one hundred francs in gold.

The teaching of the metric system in the schools should begin immediately, and should be made obligatory by a law promulgated by the respective governments. This law would determine when the present system would be superseded by the metric system. I believe that two years would be sufficient to give the people a familiar knowledge of the metric systems, and to bring it into vogue in the manners and customs of the various countries. This, then, indicates that there is no time to lose, and those who have the moral and official responsibility at heart should at once set to work in a way that will bring about this necessary victory without *eclat*, but rather to bring it about unostentatiously in this great Empire which has always been valiant and full of effort, and which does not know what it is to take second place when progress is questioned.

In the schools, demonstrations could be made through pictures, designs and drawings, and by written explanations, and by all these details the metric system and its correlatives, weights, measures and fiduciary system, could be popularized.

This modest effort has no other end in view than to initiate an activity in favor of the adoption of the metric system, which would have the advantages of facilitating and augmenting exchanges for the greater good of all.

The Garage Door Problem

ONE of the troublesome problems that has arisen since the advent of the automobile garage is that of providing doors that will not be a constant source of annoyance in their operation. Swing doors, hung on the ordinary hinges, are entirely out of the question, as with the width usually required they take up too much room, and are subject to too great a strain in opening and closing. They will blow open or shut just at the wrong time, and the action of a strong wind will keep the garage men constantly irritated. Sliding doors are usually effective, but frequently lack of room prohibits their use. There is also the danger of annoyance caused by constant rattling, all of which leads to the point that in deciding such a matter the architect is best advised when he decides to secure expert advice on the subject. Herewith are shown illustrations of various types of doors which will meet conditions in any building. Figure 1 illustrates a two-door arrangement where the doors slide right and left. Figure 2 shows the floor plan of the angle type single door, of the ordinary type. This also shows the elevation of double doors showing hangers, and the manner in which the track is carried across the corner if there is considerable space between the edge of the door and the side wall.

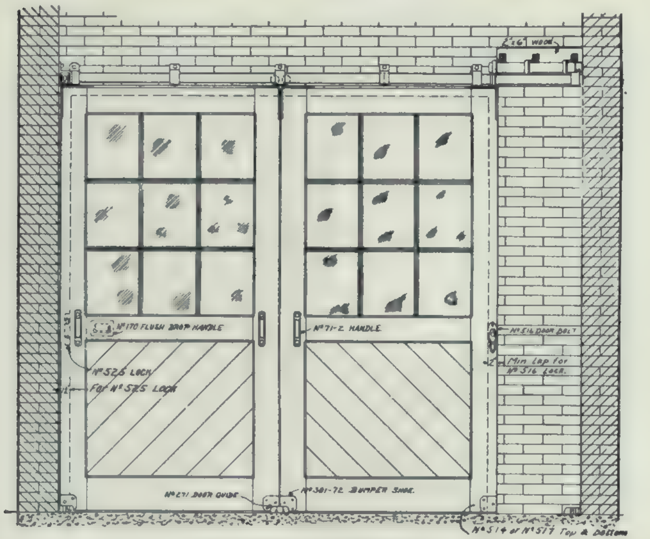


FIGURE I.

The side run of track is placed just above the front run of track, and a slot is cut in the lower track for the pendant of one of the hangers, as shown in Figure 3. If desired an extension may be added to the top of the door (either steel or wood) to bring the hanger over the side wall. In this case it is not necessary to have the side track higher than the front track, but they can be put on the same level by using the cast corner bracket, Figure 4. The application of this bracket is shown in the upper left hand corner of Figure 2. For wide openings a series of two or more doors may be hung on a double track, as shown in Figure 5. Automatic control of garage doors is, of course, the most desirable solution of the problem. In climates such as that of Canada it is necessary that doors be kept closed as much as possible, and in a busy garage there is a continual running to and fro from the office to the door. Several devices operated by electricity have been placed on the market, and make a strong appeal, the idea of opening and closing the doors by pressing a button from a stationary position inside being especially attractive. The operating device is controlled by push buttons; one button opens the doors, another closes the doors, and the other button stops the doors at any point. The control buttons can be placed at any point in the building. It is a simplified device, made of unbreakable steel parts and actuated by an electric motor. It is placed above the door level, and does not occupy any valuable space, and can be installed by any electrician. Figure 6 shows a garage door of this type, the device being applicable to any type of door.

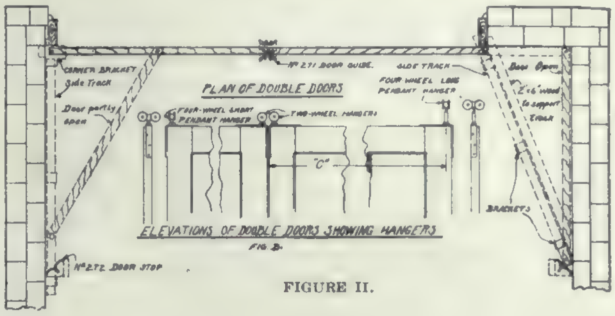


FIGURE II.

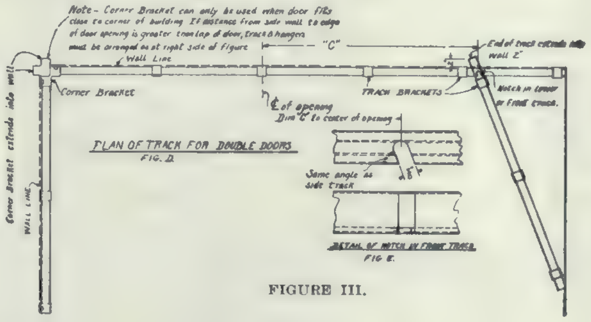

Note - Corner Bracket can only be used when door fits close to corner of building. If distance from side wall to edge of door opening is greater than lap of door, track & hangers must be arranged as at right side of figure
Wall Line
"C"
End of track extends into wall 2"
Corner Bracket extends into wall
Corner Bracket
TRACK BRACKETS
Notch in lower or front track.
℄ of opening
Dim "C" to center of opening
PLAN OF TRACK FOR DOUBLE DOORS
FIG. D
Same angle as side track
WALL LINE
DETAIL OF NOTCH IN FRONT TRACK
FIG E.

FIGURE III.

◆

The Cause of a Low Bid

The public, as a general rule, when inviting competitive bids on any piece of work, usually gives consideration only to the lowest bid received.

Apparently the lower the bid, the more consideration it receives. This procedure has brought about a condition in competitive bidding that is of danger to the public. It is creating an effort totally toward cheapening every piece of work, without proper consideration as to its quality.

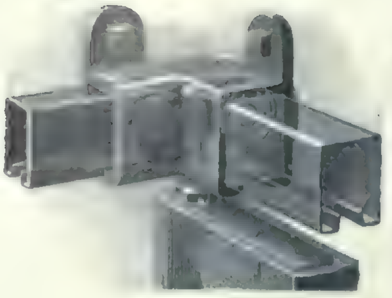


FIGURE IV.

The income tax return reports, Federal Trades Commission report, and the data collected all over this country, show the terrible condition of affairs in structural contracts.

Contractors are of the opinion that one of the greatest causes for losses in construction work is ignorance of the cost; the next greatest cause is lack of proper capital.

The several reasons why bids are too low, architects and contractors enumerate as follows:

First—An absolute ignorance of the cost of the work contemplated.

Second—A destructive desire to cut the other fellow's bid, no matter at what loss to themselves.

FIGURE V.

Third—An effort to make the original bid as low as possible, even below cost if necessary, and take the chance to recoup on substitution or extra work.

The public is awakening to the fact that accurate knowledge of the costs of manufacturing is the ultimate salvation of the manufacturing business of this country.

In so far as the overhead expenses are concerned, this idea has not been accepted by the majority of contractors; some make the statement that they have no overhead expenses; this might obtain in certain cases where the contractor pays no license or taxes of any sort, and carries no protective insurance; nor has any of the incidental expenses that tend to his responsibility.

FIGURE VI.

As long as the public is demanding cheap work, it is unquestionably getting it, and everyone knows where less than cost is paid by any individual, the consumers, as a whole, including himself, ultimately pay the shortage, thus maintaining ever and ever the equation. "Building Review."

Higher Cost of Building and Living

Added to the high cost of living, which has affected practically everything that we consume or wear, is another factor, the influence of which will be felt during the coming year—the high cost of building. During the boom years, every town and city in Canada, almost without exception, saw more buildings erected than were necessary. For three years speculative building has been at a standstill, and houses for renting purposes have not been built. With the growth of industry in all centres, there has been created a demand for modern houses of moderate size on the part of mechanics and others enjoying increased wages. Taking Toronto as a typical example, there are no such houses available. All houses erected within the past five years—built either to sell or rent—are now occupied. The only vacant houses are some of the close-in old-time residences too large for a renting family to occupy, and unsuitable as rooming houses owing to the fewness of the rooms for the size of the building to be heated. It is impossible to rent a modern house in Toronto at the present time. Apartment houses are not only filled, but most of them have a waiting list. There is an insistent demand for houses and apartments that must be met. From the conditions existing, W. W. Pearse, whose position as city architect and superintendent of buildings, coupled with a keen analytical mind, adds judicial weight to his opinion, in conversation with the editor of CONSTRUCTION, expressed the firm belief that the year 1917 would see greater building activity in Toronto than for several years past. "The buildings must be built," said Mr. Pearse, "to supply the demand, in spite of the higher cost of materials and the scarcity of labor."

It follows that rents will increase to pay interest on the extra investment, thus adding another, and a very vital element, to the increased cost of continuing to occupy this mortal sphere.

◆

Daylight Saving in Australia

The daylight saving bill recently passed by the Federal Parliament provides that all clocks throughout Australia shall be put forward one hour at the end of September, and put back again one hour at the end of March each year. The object of the Act is to utilize more daylight in the early part of the day and give more daylight after business hours to all persons throughout the Commonwealth.

◆

Competition Postponed

Consul-General J. I. Brittain reports from Sydney, Australia, that owing to war conditions the reception of designs in the Federal Parliament House competition for Canberra has been postponed.

Garage Elevator Equipment

IN deciding what type of elevator to install in a garage many things have to be considered—the size of the building, the number of floors, the number and size of the autos to be handled, and not least of all, the amount the owner is willing to invest in this part of his equipment. While a hand-power machine might answer in a small garage, moving cars from one floor to another only occasionally, it would be entirely inadequate for a modern city garage, having several floors and handling cars every hour of the day and night. If the elevator service is poor, the whole business is affected. If the elevator breaks down, the garage customers cannot get their cars down from the upper floors, and usually are not slow to express their minds. It is poor economy to install a "cheap" elevator in a garage.

The hand-power elevator is only advisable where the cost is to be kept to a minimum, where the travel distance is short and the service light.

The hydraulic plunger elevator is less expensive usually than the electric for a short travel, providing a water pressure of sixty pounds or over is available. Care must be taken that the valves and piping are heated to protect against freezing in winter. When kept packed to prevent leaking this type is very satisfactory, and the fact that the water service is seldom cut off as compared with electric power is very much in its favor.

The electric elevators, however, are the type most used, and with the spread of electric power, are steadily gaining over others. The electric elevators may be divided roughly into two groups—the belt driven and the direct connected. Before the elevator motor and controller had been brought up to their present efficiency the practice was to drive a countershaft from the motor by a belt and drive the elevator gearing from the countershaft by two belts—one crossed to run in the opposite direction to the other. On the driving shaft of the elevator gearing are idler pulleys running freely one on either side of the driving pulley keyed to the shaft. Suitable shifting devices shift one or other of the belts from the idler pulley into the driving pulley, and this causes the elevator to run up or down as required. One objection to this type is that it is necessary to first start the motor and shafting before the elevator can be used, and they continue running after the elevator has stopped, thereby wasting power; also there is the additional wear and tear on belts and noise of running belts and pulleys. On the other hand, this type of elevator will stand more hard usage and abuse than where the motor starts and stops each time with the elevator. Further, where electric current is purchased on the horse-power or peak load rating, and not by meter, the power bills will be smaller with the double or shifting belt elevator. A smaller motor may be used, since the motor is up to full speed, when load is thrown on and the momentum of the motor and countershaft helps to overcome the inertia of elevator machinery and load.

In most of the cities, however, power is now furnished on a meter basis, and for this reason it is more economical to use an elevator controller to stop and start the motor with the elevator, driving the latter by a belt, or having the motor direct coupled to the gearing. The former is known as the single belt elevator, and meets the need for elevators of moderate capacity, with speed up to forty or fifty feet per minute, where the owner is not willing to install the more expensive but much better direct connected type. With proper type of motor, controller and safety devices, both direct current or alternating current may be used with equally good results. The motor should be designed to meet the requirements of this service —to start up under full load from rest without excessive inrush of current, and with alternating current, a circuit breaker device should be used to protect against phase reversal and single phase conditions.

The direct connected elevator is the best suited for heavy capacities and higher speeds. An elevator of this type recently installed in the Willys-Overland, Limited, plant, at West Toronto, has a capacity of five thousand pounds, with speed of ninety feet to one hundred feet per minute. The machine has tandem worm gearing, interlocking type, with right and left-hand worms, so that the thrust of one worm gear is counteracted by the other. The worms are cut from a one-piece steel forging, the worm wheels have phosphor bronze rims mounted upon heavy castiron hubs. The gear teeth are accurately machined to mesh with the driving worms and with one another. A heavy castiron housing encloses the worm gearing, which runs in an oil bath. The cable drum does not depend for driving on any keys in the drum shaft, but is bolted to the worm wheel centre, which has a flange extended through the side of the gear case for this purpose.

The motor is twenty-five horse-power capacity, slip ring type, with high starting torque to suit alternating current, twenty-five cycle, three-phase, five hundred and fifty volts.

The controller, mounted above the motor, is semi-magnet type, mechanically operated from a hand lever in the car. Car switch full magnet control can also be furnished when desired. In this case the simpler control with fewer magnets was desired. The controller admits the current to the motor to make it run in the proper direction, closes the circuit to the oil immersed A.C. brake magnet, which opens the brake shoes and then cuts out the starting resistance gradually to start the elevator smoothly and accelerate to full speed.

The car is about nine feet wide by twenty feet front to back, giving plenty of room to handle the largest automobiles. It is constructed with steel frame work, strongly braced, and hardwood floor. The sides are enclosed with steel wainscotting, and the top is protected by a heavy wire screen.

The elevator is equipped with numerous safety devices, each of which protects the elevator against a possible contingency.

Should the power be cut off or the fuses burn out, the magnet brake will instantly release, and the brake shoes will be applied and stop the elevator.

If the car should meet any obstruction while it is descending, a safety swiach cuts off the power and stops the machine.

Below the car are the safety grips—heavy steel jaws operated by a powerful wedge action, and connected by cable to a safety speed governor at the top of the elevator wellway. If the car attains a speed, say, twenty-five per cent. above normal from breaking of cables, or any other cause, the governor grips the connecting cable, and holding it, causes the safety jaws to clamp and then gradually tighten upon the guide rails until the car is brought to a stop.

If an operating cable should break, or anything go wrong with the hand lever in the car, the machine automatically shuts off the power at top and bottom, and, if for any reason whatever the car should run past the top or bottom landings, the hatchway switch will be opened, cutting off the power lines. Beyond these again are spring buffers in pit under the car, and counter-balance weights to cushion the stop should the car go that far beyond the limits.

The machinery is mounted on heavy steel beams, with reinforced concrete floor, leaving slots for the cables to pass through to the car and counter-balance. The guide rails are cold drawn steel T-rails, securely bolted to the walls of the wellway. Two sets of counter-weights are used—one attached directly to the car, the other to the winding drum. Their combined weight is heavier than the car, so as to counterbalance the average load in order to secure economical operation. The door openings are protected by sliding balanced gates covered with wire mesh.

Electric light and annunciator on the car complete the equipment, which is of the highest grade and efficiency throughout.

Small Concrete Garages

BECAUSE of the necessary presence of gasoline and oils required for car operation and maintenance, there has been considerable increase in the fire menace wherever an automobile or motor truck has been added to one's personal property.

Some cities and towns have passed ordinances with a view to regulating the housing of motor cars and providing storage for gasoline, so there are a few car owners who enjoy some safeguards against the menace of the automobile.

Instead of being built of permanent fireproof materials, most garages in the past have been built of impermanent and thoroughly combustible ones—built to increase fire risk rather than reduce it. Some day insurance companies and fire protection associations may be able to influence legislation that will solve the garage problem from the standpoint of compelling that all structures where automobiles are housed shall be built of fireproof materials.

Concrete may be applied in garage construction in several ways—monolithic, concrete block, stucco on metal lath supported by metal frame, to say nothing of concrete tile and concrete brick. Yet the full advantages of concrete from the standpoint of fire-safe construction are not realized unless the material is used to build the entire structure. When built two storeys high, so that living quarters are provided for a chauffeur and his family, fire-safe garage construction implies that the floor of the second storey should be of concrete.

There is a peculiar combination of merit and adaptability in concrete. Structures built of it are not only fireproof, but the architect or builder can reproduce many very pleasing types of architecture. Concrete means permanence, and that means doing away with the annual expense of painting, repair and other maintenance which represents such a burden where impermanent construction is used.

Some have had the impression that concrete is costly as compared with other types of construction. As a matter of fact, conditions in the building materials line have been such that for a long time concrete structures have been built in many places for the same price as less durable construction would have cost. Where there have been occasional exceptions to this, the slight additional first cost has soon been offset by the saving in maintenance and insurance.

Everywhere increasing preference is being shown for concrete construction, not only in cities, but in many rural districts and towns.

Thousands of miles of permanent concrete pavement now provide three-hundred-and-sixty-five-days-a-year roads through communities that formerly were all but inaccessible at certain seasons of the year owing to the bad condition of the highways. The fact that permanent concrete highways are increasing in mileage in strict accordance with their increase in popularity, suggests that the automobile should leave the permanent concrete highway only to enter the permanent, fireproof, concrete garage.

If careful thought is given to planning a garage, a number of desirable features may be incorporated in the structure that will not materially increase expense, yet will add considerably to the convenience of the structure. One of these consists of a repair pit of suitable dimensions, over which a car can be run when necessary to go underneath to clean it or make light repairs.

At one end there should be a small work bench with vise and other necessary tools all placed in front of a window where good light will add to the ease of making repairs. For the same reason, windows should be low enough so that interior lighting will be low down on the car rather than up toward the ceiling. All fireproof construction implies windows with wire glass in metal frames, and iron shutters outside, especially where the garage is located near other buildings. This secures effective protection from within and without in case of fire, and in view of the value of the average car, it is just as advisable to protect it from without as to protect other structures from the menace of the car. Fireproof doors also should be used.

Under no circumstances should a heating plant be placed in the structure. If near the house, and there is a steam or hot water heating system in the residence, pipes may be extended to the garage. Otherwise a separate heating plant must be maintained outside of the garage. In the country it may not be desirable to heat the structure. In the town or city, the residence and garage are usually located on the same lot, not far from each other, and therefore connection can readily be made to the house heating system if desirable.

A gasoline storage tank of steel, encased in six inches of concrete, and equipped with a gasoline pump, should be placed outside of the garage underground, and say, ten feet distant from the structure. The top of this tank may be two feet below ground level. Pipe and pump connections should be a part of the tank equipment, and should lead into the garage, although the inlet for filling the tank should be out of doors.

Open lights and fires must be avoided around the automobile on account of the prevalence of gasoline vapor. When artificial light is necessary, only electric lights should be used, and the wiring should conform to the requirements of the Board of Fire Underwriters, so that danger of fire from improper electric circuits will be eliminated. When electric light is not available and the garage must be entered at times when artificial light is necessary, doors and windows should be opened for a few moments in order to release any accumulation of gasoline vapor.

If the car is to be washed at times inside the garage, then a drain should be provided at a central point in the floor, which should be sloped toward this drain, that in turn should be connected with a pipe leading to a sewer line or similar outlet. If the car is to be washed out of doors, then a small concrete-paved area at the front of the structure will serve as a convenient washing platform, and prevent a mudhole. Locker room for storing blankets and miscellaneous car accessories will suggest themselves as desirable conveniences to be provided. These, of course, should not be considered as a part of the cost of the building but rather as the cost of gratifying individual tastes and desires.

Certainly an automobile or a motor truck represents sufficient investment to warrant protection against fire. Likewise the increased danger of fire that the automobile or motor truck introduces warrants housing such a vehicle in a structure that will confine fire that may break out in the garage to that structure only and prevent damage to nearby buildings.

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Influence of Foreign Ingredients on Steel

An important paper by Dr. J. E. Stead, read at the annual meeting of the Iron and Steel Institute recently, discussed the effect of small quantities of phosphorus, sulphur, manganese, copper and tin on the qualities of steel. Attention is drawn to the need of greater precision in describing experiments on various steels. For example, in recording the results of tests of tensile strength, the dimensions of the test-pieces should be stated, and, in dealing with normalizing and annealing, the temperature of heating and the time of cooling to below redness should be recorded. Speaking generally, the deleterious effects of impurities appear to have been exaggerated. Thus the effect of phosphorus within 0.1 per cent. is comparable with that of carbon, and 0.13—0.20 per cent. is desirable to give good machining properties. Phosphorus alloyed with iron also makes the metal less liable to corrosion. While sulphur *per se* may cause "red-shortness" in small quantities, it is actually beneficial provided manganese is also present. Silicon up to 1.5—1.75 per cent. increases the limit of ductility and tensile strength, while copper, in quantities less than 0.5 per cent., has little or no influence on the mechanical properties. Tin, however, in any sensible quantity should be avoided, as it makes the steel difficult to roll, and hard and stiff when heated.

Civil Engineers' Annual Meeting

With the formation last year of a Committee of Society Affairs to deal with problems confronting the society, and to bring in recommendation for its betterment, there commenced what promises to be a new era in the history of the Canadian Society of Civil Engineers.

The convention held in Montreal on January 23, 24 and 25, in the society's building, at 176 Mansfield street, has stirred up more interest on the part of the members in society affairs than any meeting for several years. The most important feature was the acceptance by the society of the committee's report of fourteen recommendations, published in the January issue of Construction.

At the opening session, the chair being occupied by J. H. Duggan, President, the reports of Council, Library Committee, Treasurer, Finance Committee, and reports on branches were read. In the afternoon session the following committee reports were read and discussed: Conservation, Roads and Pavements, International Electro-Technical Commission, Steel Bridge Specifications, Educational Requirements, Sewage Disposal Sanitation, General Clauses, and Steam Boiler Specifications.

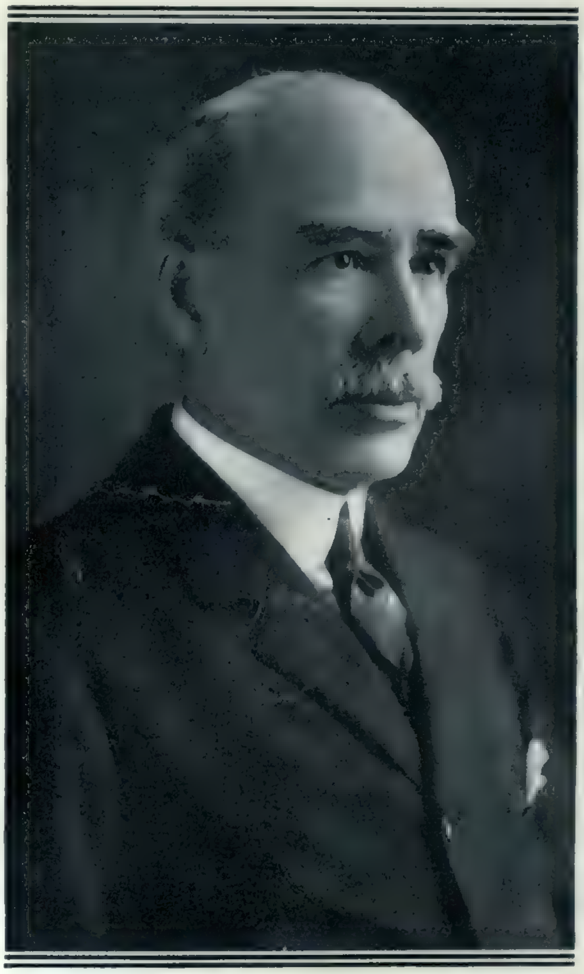
CONSERVATION.

Bearing upon the relations of the society with the development of Canada, the report of the Committee on Conservation is of particular interest. In part it follows:

"The events of 1916, and especially of the past few weeks, have served to emphasize more forcibly than ever, the relation of economic efficiency to national strength and safety," says the report. "Among the concrete achievements of the past year, the conclusion of a treaty whereby Canada and the United States will cooperate in the protection of migratory bird life should prove of inestimable service to agricultural and forest production, the two chief branches of Canadian primary industry."

Continuing the report says: "As a result of recent action the future economic development of the Dominion will benefit by the aid and guidance of systematic industrial research. The appointment of the Industrial Research Commission by the Dominion Government and the corporate enterprise of the Canadian Pacific Railway in promoting scientific research will enable Canadian industry to utilize the services of two highly organized institutions. In the same manner as the forest industries are now in receipt of the services of the Forest Products Laboratories at Montreal, every form of industry should be enabled to avail itself of expert assistance in the solution of its peculiar problems. To achieve the maximum results industrial research must be linked up with a thorough system of technical education.

"Town planning progress merits special mention as a conservation movement. During the opening decade of the century, Canada invested approximately $600,000,000 on municipal growth, largely for civic improvements. Heavy additional expenditures have been made since 1910. The efficient investment of capital on such a large scale cannot be secured as long as municipal development continues in haphazard manner. Adequate legislation and administrative machinery must be provided to control and guide urban expansion. During the past year distinct progress has been made in this direction, and it is hoped that every Province in the Dominion will shortly possess proper provision for thorough control of housing and town planning.



JOHN STOUGHTON DENNIS, C.E., D.L.S., D.T.S., PRESIDENT CANADIAN SOCIETY OF CIVIL ENGINEERS.

"It is gratifying to record the decision of the Ontario Government to remodel its forest protective service along the most approved lines. The remarkable development of our pulp industry indicates the potential value of our forests and the wisdom of affording the most efficient protection obtainable. The work of determining the extent of our timber resources progresses steadily, surveys of British Columbia and Saskatchewan forests having been completed during the past year."

The report of the Council stated that the total membership was 3,047, and that twenty-one members had given their lives for the Empire in the European war. A total of $1,966 had been subscribed to the fund in aid of families of members enlisted for active service, while $722 had been subscribed for the Canadian Engineers' Hospital and Medical Comforts Fund. The receipts of the society during the year had been $23,726, and there was a balance in hand of $3,642.

James White, vice-chairman of the Commission on Conservation, said that Col. Leonard had forwarded a paper by Leonard Curtiss, who believed that the influx of British immigration into Canada after the war will be largely increased, and it would be a great problem to keep them from massing in the cities. In South Africa after the Boer War the country could not absorb the population, and a large proportion of the disfavor in which South Africa was held by people in Great Britain was due to the failure of the country to absorb the British labor.

M. J. Butler, C.M.G., asked whether the Research Council which had been appointed by the Government were going to do anything definite and get into a position to be able to give the manufacturers help in definite problems; and was anything specific being done in connection with after war problems.

R. A. Ross, of Montreal, who is a member of the Advisory Research Council appointed by the Government, explained the work of the Council, and said that the manufacturers must help the Council if they wanted the help of the Council. They must let them know what raw materials they were using, what quantity, and where they got them from, and similar information.

The Council had access to a great deal of information which was buried in Government files at present, and which they intended to disinter and put into practical shape. He felt sure the Council would be able to give practical service on the problems of Canadian manufacturers.

Mr. White, speaking about the Commission of Conservation, remarked that it was poorly named and should be called the Commission for Economic Development of Canada, which was its real work.

The President, Mr. Duggan, delivered an address at the afternoon session, in which he gave some interesting statistics on the growth and development of the society. In 1887 the city of Montreal had 30 to 40 per cent. of the membership, the area bounded by Toronto, Ottawa and Montreal 65 per cent.; the district Port Arthur to Montreal, 80.5 per cent., and the district west of Port Arthur only 7.4 per cent. In 1916 Montreal had decreased to 17.4 per cent., the Toronto, Ottawa and Montreal area, 36.7 per cent., and the district Port Arthur to Montreal 65.5 per cent. The district east of Montreal had remained practically stationary, being 12.8 per cent. in 1887, and 11.9 per cent. in 1916, but the district west of Port Arthur had increased from 7.4 per cent. to 23.4 per cent. Montreal still maintained its lead in actual numbers over any other city, having 367 corporate members, against 168 in Ottawa, which had the next largest number. While there had been a large increase in the number of members in the districts tributary to Montreal, there had been a much larger percentage of increase in the number of members west of Port Arthur, so situated that they could only reach Montreal at much expense and with considerable loss of time. It was to be expected that members so situated should feel strongly that they were best served as regarded their daily work by the local associations, and had little interest or sympathy in the general work of the society as it existed to-day. His impression was that this attitude had increased largely of late. Its tendency under the present organization was to still further increase, and if they were to build up a strong national society, representing the whole profession in Canada, it was a factor to which most earnest consideration must be given. In 1906 there were only two branches, while in 1915 there were ten branches, with 30 per cent. of the whole membership. In 1887 the members were 53 per cent. of the total membership; in 1916, 22.6 per cent.; associate members in 1887 were 15.4 per cent.; in 1916, 52.5 per cent., or, classing juniors with associate members, 57.8 per cent. Summarizing, the percentage of members had dropped from 53 per cent. to 22.6 per cent., while percentage of associate membership had risen from 15.4 per cent. to 52.5 per cent.

In the evening the visiting members were entertained by the local society to a dinner at the University Club, which was followed by a smoker and entertainment at the society's headquarters. On Wednesday morning, as guests of the Dominion Bridge Company, the members visited this firm's plant and its subsidiary companies engaged in munition work, and were later entertained to a dinner by them at the Windsor Hotel. The afternoon session was further taken up with reports of committees.

ELECTION OF OFFICERS.

The election of officers resulted as follows:

President—J. S. Dennis, Montreal.

Vice-Presidents—J. M. R. Fairbairn and Lieut.-Col. C. N. Monsarrat, Montreal; A. St. Laurent, Ottawa; T. H. White, Vancouver.

Past Presidents—G. H. Duggan, Montreal;

M. J. Butler, C.M.G., Montreal, and F. C. Gamble, Victoria, B.C.

Treasurer—E. Marceau, Montreal.

Secretary—C. H. McLeod, Montreal.

The eight new councillors elected were: Messrs. R. A. Ross and J. C. Smith, Montreal; H. Longley, St. John, N.B.; A. R. Decary, Quebec; Jas. White, Ottawa; G. A. McCarthy, Toronto; Wm. Pearce, Calgary, and J. H. Kennedy, Vancouver.

The rest of the council remains as before.

The new President, Lieut.-Col. John Stoughton Dennis, C.E., D.L.S., D.T.S., is assistant to Lord Shaughnessy, President of the Canadian Pacific Railway Company. He was born in Toronto in 1856, being a son of the late Lieut.-Col. J. S. Dennis, who was the first Surveyor-General of Canada, and later the first Deputy Minister of the Interior. Mr. Dennis was educated in Upper Canada College, and graduated from the Military College, Kingston. He graduated as a topographical surveyor in 1877, and for several years was engaged on survey work for the Dominion Government. From 1879 to 1882 he was engineer and surveyor for the Hudson's Bay Company. In 1896 he entered the service of the Northwest Territorial Government as chief engineer, and in 1899 became Deputy Minister of Public Works in the Northwest Territory. In 1902, Mr. Dennis joined the service of the Canadian Pacific Railway. Since that time his career has been one of progress, the important development of the C.P.R. lands in Alberta being directly in his control. All who have been associated with Mr. Dennis will agree that in electing him to the position as President of the Canadian Society of Civil Engineers the society will receive the benefit of his broad experience and training, coupled with his keen judgment and a progressiveness that will mean much for the society.

Quebec Association of Architects

Members of the Province of Quebec Association of Architects held their annual meeting on January 13th, at the rooms of the association, Beaver Hall Square, Montreal. In the absence of Mr. E. B. Staveley, the president, the chair was occupied by Mr. Hugh Vallance, first vice-president.

The annual report of the council was presented by the chairman. This referred to the deaths during the year of Mr. F. X. Berlinguet, one of the founders of the association, and of Mr. Gordon Blackader, killed in action in France. The question of amending the charter of the association had been considered by the Legal Committee, the object being to render it more explicit, and thus to do away with any more adverse decisions by the courts, as had happened lately in the Court of Reviews. Amendments to the charter were presented to the Quebec Legislature at its last sitting, in December, 1916, and were adopted after some modifications which were found acceptable under the circumstances. The committee believed that the association at last would be a closed one, such as those pertaining to lawyers, notaries, doctors, etc. The committee on quantity surveying had considered the question of introducing this system in the Province of Quebec. The committee, after collecting data from various sources, was of opinion that there were two principal difficulties to contend with before a system could be put into operation. The first was the matter of getting the contractors to act unanimously, as a great divergence of opinion had been expressed by those who had been approached. The second was to establish a competent and responsible board of quantity surveyors to properly handle the amount of work that would be involved. The incoming council should continue the study of the question and endeavor to obtain the co-operation of both architects and contractors. On the motion of Mr. Archibald, seconded by Mr. A. Beaugrand-Champagne, the report was adopted, after discussion by Messrs. Archibald, Doran, Vanier, Beau-Grand-Champagne, Chausse, J. Venne and Monette.

The treasurer's report showed receipts of $7,181, including a balance of $4,734 was brought forward, and expenditure of $5,954, including a purchase of $2,977 of war bonds, the balance in hand being $1,226. In the report of the Quebec section it was stated that Mr. E. B. Staveley had been re-elected president, and Mr. J. S. Bergeron, secretary and treasurer. The balance in bank is $149. A discussion on a reduction of fees, proposed by Mr. Jos. Perrault, and seconded by Mr. W. S. Maxwell, followed. It was agreed, on the motion of Mr. Beaugrand-Champagne, seconded by Mr. J. Venne, that the fees of members remain at $15.00, and those of the students be reduced to $2.00. This was carried.

The election of the officers for 1917 resulted as follows: President, Mr. Hugh Vallance; First Vice-President, Mr. G. A. Monette; Second Vice-President, Mr. J. H. LeBon; Secretary, Mr. J. Emile Vanier; Treasurer, Mr. D. Norman MacVicar. Members of the Council: Messrs. U. J. Asselin, Alphonse Piche, A. Beaugrand-Champagne, J. M. Miller and E. I. Barott. Delegates to Royal Architectural Institute of Canada are to be: Messrs. Alcide Chausse, D. R. Brown, J. P. Ouellet, Herbert Raine and Jos. Perrault.

Some correspondence between Sir Robert Borden, Hon. R. Rogers and the society relative to plans submitted to the Department of Public Works for the erection of Government buildings in Ottawa was read. It was then agreed to hold the next meeting of the association in Quebec.

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CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

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FRASER S. KEITH - - - EDITOR AND MANAGER

Vol. X Toronto, February, 1917 No. 2

Influence of Professional Bodies

Why a professional body such as the Canadian Society of Civil Engineers does not exert a greater influence in the affairs of the country is a question that is giving the members particular concern at the present time. There is not another organization in Canada composed of an equal number of men whose members individually possess a higher standing in their respective community than the members of the Canadian Society of Civil Engineers.

When we consider the qualifications for leadership possessed by many members of the Society, their expert knowledge, their breadth of vision, and their sterling qualities, it is little short of paradoxical that the Society, as a whole, plays no greater part in our national development. All material human progress has had its foundation on engineering in some one or other of its branches. In a country like Canada the engineer is the greatest individual factor in the country's expansion. The Canadian Society of Civil Engineers, composed of three thousand trained men, is potentially a great national asset, yet from the viewpoint of collective influence, it is as undeveloped as the mineral and timber areas of British Columbia and the idle prairie lands of the West.

Why?

Because the objects of the Society as outlined in the Constitution and as followed out in practice are self-centred.

The word "Civil" in the name is unquestionably a drawback, because of the prevailing acceptance of the term "Civil Engineer." This can be overcome by the adoption of a title such as the "Institute of Canadian Engineers," or the "Canadian Engineering Institute," but the fundamental basis of the Society's apparent failure to measure up to its opportunities for national usefulness *will not be surmounted* until the expressed and practiced objects of the Society are of a broader nature.

No man can live unto himself alone, and no group of men can combine to operate within a defined circle and expect its greatest achievement when that circle is narrower than the one prescribed by the radius of influence of the broadest and most influential of its members.

To achieve its real function, and the function that the ability and training and experience of its individual members qualify it to accomplish as a mere matter of natural destiny, the Canadian Society of Civil Engineers must broaden its objects and give greater thought and discussion to national affairs and be the centre from which broad and practical suggestions for the most effective development of our national resources are inspired. When this is done, the engineering profession in Canada will occupy a different position and realize, as it should realize, the outstanding place of national influence that its importance warrants and which in the evolution of national efficiency which Canada must shortly undergo, the profession should naturally assume.

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Shipbuilding Possibilities

Puget Sound shipyards, according to figures compiled by the Seattle Chamber of Commerce, are engaged on contracts totalling thirty-eight million three hundred and seventy-five thousand dollars. These shipbuilding activities employ five thousand eight hundred men, who receive seven hundred and fifty thousand dollars monthly. These figures indicate clearly that an industry has sprung into being in the State of Washington, over night as it were, on a scale of importance that warrants serious consideration by the authorities in Canada. We have already a small amount of shipbuilding on the Pacific coast on Burrard Inlet, and recently a company has announced the commencement of operations at the mouth of the Pitt River, where it joins the Fraser River, a few miles above New Westminster. In the light of what the Washington shipyards are accomplishing, it would appear that we had barely started. It will take many years after the war to supply the ship wastage, and the demand for ocean-going ships will be heavy from every maritime country in the world. It is evident that this is an industry upon which Canadians might concentrate to advantage, both from personal profit and the opportunity it offers of building up a much needed merchant marine.

The Montreal Builders' Exchange

ANNUAL MEETING HELD JANUARY 22.

Mr. J. P. Anglin Elected President.

Despite the fact that the building permits issued in Montreal in 1916 were less than those of the previous year, the members of the Montreal Builders' Exchange found that, commencing with the middle of the year, they had, as a rule, all the business they could handle.

At the annual meeting of the Exchange, the report of the secretary, D. K. Trotter, which included the balance sheet for the year, was read and approved, showing the affairs of the Exchange to be in a satisfactory condition, in view of conditions generally in the building trades. The chair was occupied by John Quinlan, retiring president.

The meeting unanimously adopted a resolution favoring the creation of a Bureau of Municipal Research in Montreal, and another advocating the study of preferential tariff within the Empire.

The officers elected for the ensuing year are: President, J. P. Anglin; first vice-president, W. C. Munn; second vice-president, Robert F. Dykes; directors, Alex. W. Bremner, Alen Charette, L. J. Conroy, A. Cross, T. D. Douglas, W. M. Irving, D. McCuaig, W. E. Potter, J. J. Roberts, J. E. Walsh, and W. E. Ramsay.

"In presenting you with my report for 1916," said Mr. Quinlan, in delivering the President's annual address, "I do so with the feeling in which, I believe, you all share—that we have passed through one of the most eventful years in the history of this Exchange. The war which is now in its third year keeps steadily progressing; and, while we have reached the point when we can safely say that there is absolutely no doubt of the ultimate result, we still find it necessary, in order to bring about its speedy and satisfactory conclusion, to give the Allies the first call on our men and material. You have felt the full force of these altered circumstances, and it speaks well for your various organizations that the vast majority of them have steadily maintained and increased their standing and reputation.

"While the building permits issued by the City of Montreal would indicate an amount of building done in 1916 considerably less than that of 1915, the figures do not by any means give a correct idea of the amount of construction work handled by you in the year which has gone. As a matter of fact, if we were to take an inventory of the actual business done by each member of this Exchange we would find that our operations in 1916 more nearly approached the normal than the city figures would indicate. The season started in with little or no business offering, but the demand for building increased with the advent of midsummer and autumn until we found ourselves in the position where it was not a question of how much work we could get, but how suitable labor and materials could be secured speedily enough to fill the contracts offering. Of course, the great demand was for factories and munition plants of all kinds. Most of these structures were built outside of the limits of the City of Montreal, hence the reason for their not appearing in the statistics furnished by its building department, and most of them were erected within a radius of a hundred miles by Montreal contractors, and I have the greatest pleasure in complimenting you on the speed and thoroughness with which you carried out these contracts under conditions which were far from ideal. I will, indeed, venture to say, gentlemen, that the erection of some of these plants by you created a record in speed and thoroughness which has never before been reached.

"At the moment the building contracts in sight for 1917 do not seem quite so many, but nevertheless the general public are prosperous, and we may expect to see in the near future a more general demand by our citizens to own their own houses and to occupy larger and better ones. During the last three years Montreal has grown, but the number of new houses erected in that time forms a small percentage of the total amount of building operations. There are at present few vacant houses in the city, and already a demand is growing for homes of all descriptions. We must also expect a large increase in the number of existing school buildings and a still greater number of factories.

"The period of this war has been productive of many new difficulties, but I believe that the close of the war especially will present more varied and acute problems to be solved. For one thing the amount and quality of available labor and its assimilation into the industrial life of our city and province will require careful study, and we, as builders and as citizens, must be prepared and organized to deal with these subjects in a manner satisfactory to all the interests involved. Canada has at present about 400,000 men in khaki, recruited largely from the ranks of the skilled mechanics. Every effort will, I am sure, be made by you on their return to place them in positions for which their training and experience fit them.

"Naturally the difficult conditions of the past year have been reflected in the ordinary work of the Exchange. While attendance at our meetings has not been so large and the interest of members not so great as could be wished, nevertheless an appreciable amount of work has been done, and the Exchange is being regarded more and more as an organization with a watchful eye on all matters affecting the interests of its members, and whose power to effect reforms and rectify abuses in our trades and the conditions under which they are operated is limited only by the amount of active interest you take in the work of your directors and the support you give them.

"Your Exchange has during the latter part of last year concerned itself mainly with the inauguration of an exchange for the hire and sale between our members of contractors' machinery not in use, and with pressing upon the Hon. Mr. Taschereau certain amendments to the bill which he introduced last session at Quebec and succeeded in having adopted, regarding the privileges of workmen, supply men, sub-contractors, and contractors. As soon as your directors learned that it was the intention of the Provincial Minister of Public Works to bring forward this measure they appointed a representative and influential committee to study the subject, frame, if necessary, other and more suitable amendments, and in general to take care that the interests of our members were not jeopardized. In order to obtain as wide an expression of opinion as possible your board, at the request of this committee, called a general meeting of the Exchange, when many valuable suggestions from the members present were received. Suggestions were also invited from other bodies. The bill as finally approved by the Legislature improves but little the position of the workmen, the supplier of materials, and of the sub-contractor, and leaves the general contractor as he was. The work of your committee was rendered particularly difficult by the fact that this was a Government measure, and the greatest pressure had to be brought to bear in order to have our amendments considered. Further, the short time that elapsed between the printing of the bill and its presentation to the House increased our difficulties, and it speaks volumes for the watchfulness and diligence of this committee that they safeguarded our interests so well. The heartiest thanks, not only of the members of this Exchange, but also of every builder and building supply man in the Province of Quebec are due its members. A copy of this bill as soon as printed will be mailed to each member. I may remark in passing that perhaps a good deal of the dissatisfaction that existed among our ranks in regard to the previous Lien Law was due in a measure to the fact that every member did not exercise his privileges, and I would strongly urge each one of you, as soon as you are acquainted with the terms of the new measure, to exercise your rights to the full. The law has not been amended to our entire satisfaction, and the only way we can convince the Government that the suggestions we submitted were in the best interests of the building public and the business interests we represent, will be for each one of us to exercise, as soon as possible and necessary, our rights under it. Should we all do this, I am convinced that within six months the Government will be constrained to prepare a new bill, and there will be no necessity for us to agitate in the matter at all.

"In regard to the exchange for the sale and hire of machinery, inaugurated a short time ago, arrangements are practically completed, and more enquiries for the use of equipment are being received than can be satisfied. There can be no doubt that the scheme has great possibilities for our members, especially in regard to convenience and economy, and those of you who have plants lying idle will help to make the plan a success and of benefit to yourselves and your fellow-members by having your lists of machinery available for the purpose sent in as speedily as possible.

"It is a pleasure to recall that some of our members who were noted for their skill in construction work are now engaged in pulling up and tearing down—in smashing German lines and German frightfulness. I refer specially to Brigadier-General Loomis, to Major Cape, to Assistant Deputy Quartermaster-General McRitchie, to Paymaster Murray, and to the Bonnell brothers. I am proud to call these gentlemen fellow-members, and I am sure I express your thoughts when I state that they will finish the contract they have presently on hand on schedule time, fully in accordance with the specifications, and to the entire satisfaction of their clients—the British Empire. We wish them all a happy and speedy return; and when their present job is finished, and we know from their past record how well it will be done, we shall be honored to have, as we have had before, the benefit of their co-operation, their counsel, and their riper experience."

TORONTO BUILDERS' EXCHANGE.

Annual Meeting held January 22nd, 1917.

The work of the Provincial Builders and Supply Associations convention at Ottawa last year, and the coming convention to be held at London, February 13th, 1917, were discussed. The delegates instructed to ask for co-operation regarding Dominion, Provincial, and municipal contracting, and for more favorable treatment of Canadian architects, engineers, contractors and manufacturers, and that Canadian materials be used exclusively, as far as possible, in all public buildings, specifically calling attention to the Lindsay Arsenal. The proposed amendment to the Workmen's Compensation Act regarding first aid and the compensation of medical practitioners, was under discussion, and it was resolved to ask the Board to pay this compensation by a levy upon not only the employers and Government, but the workmen as well, also to regulate such compensation by adoption of a set scale.

Topics covering the general good of the Exchange, and the duty of every member to fill up his particular section of the trade, was resolved upon.

The following officers were elected for the ensuing year: President, S. R. Hughes; first vice-president, W. E. Dillon; second vice-president, Walter Davidson; treasurer and acting secretary, Jno. Aldridge; directors, Ed. Gearing, Chas. Bulley, Geo. Gander, Geo. Oakley, Jr., A. D. Grant, Wm. Clark, Jr.

BUILDERS' EXCHANGE PRESIDENT.

The newly elected president of the Montreal Builders' Exchange, Mr. James Penrose Anglin, is vice-president and managing director of Anglin's, Limited, Montreal. Mr. Anglin received his education at Queen's and McGill Universities, graduating from the latter with the degree of B.Sc. Among the leading buildings constructed by Mr. Anglin's company are: The McGill University Engineering Buildings; Goodwins, Ltd.; Edward VII and Strathern Public Schools; C.P.R. Windsor Station Power House; Canadian General Electric Building; Northern Electric and Manufacturing Company; Belding Paul Corticelli, Ltd.; St. Lawrence Sugar Refinery; Montreal Light, Heat and Power (garage); Loyola College; Toilet Laundry (extension), Montreal Foundling Hospital; Williams Manufacturing Company; Bell Telephone Company, etc., etc., all in Montreal; also Bell Telephone Company; Canadian Ingersoll Rand (two buildings), and Walter Blue Factory in Sherbrooke, Que., Canadian Vickers, and numerous branch bank buildings for the Bank of Montreal and Molsons Bank throughout Canada, as well as other leading structures in Ottawa, Quebec and Halifax.

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Day on all New Buildings About to be Erected or in Course of Erection.

BUSINESS BUILDINGS.

Hamilton, Ont.—The Grand Trunk Railway Company are erecting a freight office and shed on Ferguson avenue north, to cost $30,000; J. H. Gordon is the local agent.

London, Ont.—Architect L. A. Carrothers, Bank of Toronto building, has received tenders for the erection of a Hydro office for the Utilities Board, to cost $75,000.

Niagara Falls, Ont.—H. W. Johns-Manville Co., Ltd., 19 Front street east, Toronto, have been awarded the roofing contract on a bank to be erected for the Royal Bank of Canada, to cost $15,000; W. G. Read, 489 Victoria avenue, Niagara Falls, has been awarded the plumbing contract; Ireland & Dinham, Glenholme avenue, are the general contractors; C. M. Borter, Main street, is the architect.

North Bay, Ont.—The Imperial Bank has purchased a site on Main street west for the erection of a bank building.

Port Colborne, Ont.—Architect C. M. Borter, Main street, Niagara Falls, is preparing plans for an office and storage building for the Canada Steamship, Ltd., head office, Montreal.

Renfrew, Ont.—M. J. O'Brien, Renfrew, Ontario, has been awarded the general contract for the erection of a business block for the Jamieson Meat Co., Ltd., Renfrew, to cost $15,000; B. Evan Parry, Renfrew, is the architect.

St. Catharines, Ont.—The Great North Western Telegraph Company will proceed immediately to rebuild their offices, which were destroyed by fire.

Toronto, Ont.—Plans are being prepared for an office building on Adelaide street, near Bay, to cost $150,000, for S. Frank Wilson & Sons, 73 Adelaide street west. Architects Chapman & McGiffin, 95 King street east, are preparing plans for an office building for the Toronto Harbor Commission, 50 Bay street, to cost $150,000.

Windsor, Ont.—John Rutherbough, 1000 Wellington street, London, has been awarded the general contract for the erection of an office building for the Huron and Erie Mortgage Corporation, London, to cost $65,000; Watt & Blackwell, Bank of Toronto building, London, are the architects.

Vancouver, B.C.—The Imperial Bank of Canada has purchased a site at the corner of Homer and Hastings streets for the erection of a new bank to cost $130,000.

CIVIL ENGINEERING.

Hamilton, Ont.—Tenders will be called early in the spring for the erection of a subway at Dundurn Park, to cost $8,000; E. R. Gray, City Engineer.

CLUBS, HOSPITALS, THEATRES, AND HOTELS.

Byron, Ont.—Eggett & Company, 336 Ridout street, London, have been awarded the plumbing contract in a sanitarium for the London Health Association, London, to cost $75,000; Hyatt Brothers, 289 Edgerton street, London, are the general contractors; Watt & Blackwell, London, are the architects.

Hamilton, Ont.—Geo. Frid Company, Bank of Hamilton building, have been awarded the mason contract in an addition to a hospital for the Hamilton Health Association, to cost $15,000; Cully & Breay, 35 King street west, have been awarded the electric wiring contract; Otis-Fensom Elevator Co., Toronto, have been awarded the elevator contract; Stewart & Witton, 7 Hughson street south, are the architects. Work will commence in the spring on a club house for the Royal Hamilton Yacht Club, to cost $30,000.

Toronto, Ont.—Architect Howard Crane, Detroit, Michigan, and Hynes, Feldman & Watson, 105 Bond street, associate, are preparing plans for a moving picture theatre to be built at the south-west corner of Richmond and Victoria streets, to cost $250,000.

Kingston, Ont.—Simmons Brothers, 132 Princess street, have been awarded the heating and plumbing contracts in the addition to Queen's University, for the Military Hospital Commissions, Ottawa; J. Vince, 160 Clergy street, has been awarded the painting contract; McFarlane, 310 Johnson street, has been awarded the carpenter contract; W. S. Symons, 14 Vittoria street, is the architect.

FIRE LOSSES.

Amherst, N.S.—The International Engineering Works, Limited, boiler shop was destroyed by fire; loss $30,000.

Amherstburg, N.S.—The Empress Theatre was destroyed by fire; loss $25,000.

Belleville, Ont.—Jas F. Chisholm, Thurlow Twp., City Limits, Belleville residence was destroyed by fire; loss $7,000.

Brampton, Ont.—The Public School Board, High School was destroyed by fire; loss $25,000.

Brockville, Ont.—The telephone exchange and lighting plant for the village of Athens, Leeds County, was destroyed by fire.

Danville, Que.—The Danville Chair and Specialty Company factory was destroyed by fire; loss $40,000.

Drummondville, Que.—The Aetna Chemical Company, Drummondville, Quebec, plant was destroyed by fire.

Hamilton, Ont.—The Grand Trunk Railway freight office and shed at Hamilton was destroyed by fire; loss $22,000.

Kenora, Ont.—St. Alban's Protestant Cathedral was destroyed by fire; loss $15,000.

Montreal, Que.—Fire which broke out at 1691 Notre Dame street east, Montreal, did damage amounting to $50,000.

Montreal, Que.—Jennings & Company, Wellington and Grey Nun streets, warehouse was destroyed by fire; loss $25,000.

Niagara Falls, Ont.—The American Cyanamid Company, Niagara Falls factory was destroyed by fire; loss $150,000.

Niagara Falls, Ont.—J. P. Lang, 2032 Whirlpool street, Niagara Falls, N.Y., business block at the corner of Park street and Clifton avenue, was destroyed by fire; loss $15,000.

Peace River, Alta.—"Diamond P" store was destroyed by fire; loss $30,000.

Preston, Ont.—The Preston Car and Coach Company factory was destroyed by fire; loss $60,000.

Prince Rupert, B.C.—The Merryfield Block, Prince Rupert, was destroyed by fire; loss $15,000.

Quebec, Que.—J. B. Renaud & Company, and A. J. Turcotte & Sons, warehouses were destroyed by fire; loss $125,000. The Hotel des Marchand was destroyed by fire; loss $30,000.

Quebec, Que.—The beautiful parish church of St. Louis de Courville, in Montmorency county, was destroyed by fire; loss $100,000. Three buildings on St. Joseph street were destroyed by fire; loss $150,000.

Sherbrooke, Que.—The St. Anthony's Roman Catholic Church at Lennoxville was destroyed by fire; loss $30,000.

St. Catharines, Ont.—The Great North Western Telegraph Company offices at St. Catharines were destroyed by fire; loss $6,500.

Sydney, N.S.—McCallum's carriage shop and a few small adjoining buildings were destroyed by fire; loss $30,000.

Tillsonburg, Ont.—W. C. Brown residence was destroyed by fire; loss $6,000.

Toronto, Ont.—Robert Watson, 363 Sorauren avenue, factory was destroyed by fire; loss $20,000.

Tyndall, Man.—The Wallace sandstone quarries plant here was destroyed by fire; loss $250,000.

Vancouver, B.C.—The warehouse of Wood, Vallance & Leggatt, Limited, 573 Carrall street, was destroyed by fire; loss is estimated at about $500,000. Fire damaged the physics building of the University of Vancouver to the extent of $5,000.

Winnipeg, Man.—The interior and furnishings of the Grace Methodist Church were destroyed by fire; loss $15,000.

Winnipeg, Man.—Jobbin-Martin Company's wholesale grocery, on Market street east, was destroyed by fire; loss $150,000.

MISCELLANEOUS.

Brantford, Ont.—The City of Brantford contemplates the erection of a police station.

Brantford, Ont.—The Ontario School for the Blind contemplates the erection of a dairy building; James Govan, Provincial Architect, Parliament Buildings, Toronto.

Fordwich, Ont.—The village of Fordwich contemplates the erection of a public drive shed on Schwandt property.

Hamilton, Ont.—E. R. Gray, City Engineer, will receive tenders in the spring for the erection of bath houses for the City of Hamilton, to cost $13,000. The Park Board of the City of Hamilton contemplates the erection of a park pavilion at Watasso Park, to cost $15,000; A. P. Kappele is the secretary. Bethlehem Steel Company, Hamilton, have been awarded the steel contract in a garage for Thos. Ramsey, 15 Market square, to cost $15,000; T. Ramsden, Lister block, has been awarded the carpenter contract; Isbister Brothers, 65 Hughson street, are the general contractors; E. B. Patterson, Hamilton, is the architect.

Lindsay, Ont.—S. Victoria Agricultural Society contemplates the erection of fair ground buildings.

Lindsay, Ont.—H. T. Hickey, Peterboro, has been awarded the general contract for the erection of a cold storage for Flavelle, Ltd., Kent street, to cost $50,000; G. M. Miller & Company, 93 Yonge street, Toronto, are the architects.

London, Ont.—John Rutherbough, 1006 Wellington street, London, has been awarded the general contract for the erection of a garage for Roy Moore, London, to cost $6,000; John M. Moore, 421 Richmond street, is the architect.

Mitchell, Ont.—Fullerton, Logan & Hibert, Agricultural Hall, contemplates the erection of an agricultural hall; A. J. Blowes is the secretary.

Ottawa, Ont.—R. C. Desrochers, Secretary Department of Public Works, has received tenders for Tungsten lamps for the Departmental Building at Ottawa.

Paris, Ont.—Architects Barber & Nicolls, Temple building, Brantford, are preparing plans for a Y.W.C.A. building, to cost $30,000.

Paris, Ont.—Schultz Brothers, Brantford, have been awarded the general contracts for the erection of an addition to Mill Number 1 for Penman's, Limited, Paris, to cost $35,000; work will commence in the spring.

Port Arthur, Ont.—Architect L. M. Jones, City Engineer, is preparing plans for an addition to the fire hall on Court street, to cost $7,000. Plans have been prepared for a pulp mill for the Port Arthur Pulp and Paper Company, to cost $1,000,000, T. R. H. Murphy, chief engineer.

Preston, Ont.—The Preston Car and Coach Company will commence work in the spring to rebuild their finishing and forge shops, which were destroyed by fire.

Smith's Falls, Ont.—The Canadian Cooperage Company, Smith's Falls, Ontario, will rebuild their stave, hoop and saw mill, which was destroyed by fire.

Sudbury, Ont.—Engineer W. J. Brule has prepared plans for a nickel and copper refinery for the British American Nickel Company, 20 Victoria street, Toronto, to cost $500,000.

Toronto, Ont.—Work will commence on a garage for S. G. Whaley, Yonge street, near Briar Hill, to cost $10,000.

Toronto, Ont.—Architects Darling & Pearson, 2 Leader lane, Toronto, will call for tenders in about a month for the erection of a mausoleum at Mt. Pleasant Cemetery, to cost $200,000, for the Toronto General Burying Ground Trustees, Confederation Life Building.

PLANTS, FACTORIES, AND WAREHOUSES.

Acton, Ont.—The Reliance Shoe Company, 350 Sorauren avenue, will invite tenders in the spring for electric wiring and steam heating in their factory, to cost $15,000; J. B. MacKenzie, Georgetown, Ontario, is the general contractor.

Cardinal, Ont.—A. J. Byers, University street, Montreal, has commenced work on a factory for the Canadian Starch Company, to cost $20,000; The Dominion Architectural Iron Company, Montreal, have been awarded sheet metal contract; J. H. Hunter is the engineer.

Chatham, Ont.—Libby, McNeil & Libby, Chicago, Ill., U.S.A., contemplates the erection of a factory at Chatham, to cost $100,000.

Cobourg, Ont.—The Federal Steel and Foundry Company contemplates the erection of a steel plant to cost $250,000.

Dundas, Ont.—The Chapman Engine and Manufacturing Company, Dundas, will rebuild their factory, which was destroyed by fire.

Ford City, Ont.—The Canadian Lamp and Stamping Company, Ford City, have postponed the project of erecting an addition to their factory until the spring.

Ford City, Ont.—Architects G. Jacques & Co., 5 Sandwich street west, Windsor, Ontario, are preparing plans for an addition to the factory of the Canadian Lamp and Stamping Company, Edna street, to cost $27,000.

Hamilton, Ont.—L. O. Buist, 93 Emerald street south, contemplates the erection of an addition to the factory to cost $30,000.

Hamilton, Ont.—J. E. Rideau & Son, 12 Ferguson avenue, Hamilton, have been awarded the roofing and sheet metal contracts on a factory for the Tallman Brass and Metal Co., Wilson street, to cost $50,000; the Hamilton Bridge Works, Bay street, have been awarded the steel contract; E. Goodall, 96 Aikman avenue, is the general contractor; Stewart & Witton, 7 Hughson street, are the architects. The Chipman, Holton Knitting Company, 122 St. Mary street north, will erect an addition to their factory on Glendale avenue, to cost $60,000; McPhie & Kelly, Bank of Hamilton building, are the architects. The Spectator Printing Company, 28 St. James street south, has purchased a site for the erection of a newspaper plant, to cost $150,000, at the corner of King and Catherine streets. The B. F. Goodrich Rubber Company, Akron, Ohio, U.S.A., contemplates the erection of a factory to cost $100,000. New plans are being prepared for a factory for W. T. Rawleigh Medicine Company, 78 Duchess street, Toronto, to cost $100,000; nothing, however, is likely to be done for six months or perhaps a year.

Hepworth, Ont.—The Hepworth Light and Power Company contemplates the erection of an addition to their power house plant, to cost $15,000.

Kingston, Ont.—The Canada Light, Heat and Welding Company contemplates the erection of a factory to cost $500,000.

London, Ont.—G. H. Bolton, President Board of Trade, London, contemplates the erection of a factory to cost $50,000.

London, Ont.—A. Eisenach, c-o London Industrial Association, London, contemplates the erection of an automobile factory, to cost $100,000.

Niagara Falls, Ont.—The Watt Tolygonal Tool Company contemplates the erection of a factory.

Niagara Falls, Ont.—The American Cyanimid Company will rebuild their hydrating plant at once.

New Toronto.—Bennett & Wright, 72 Queen street east, have been awarded the piping contract in a factory for the Goodyear Tire and Rubber Company, 152 Simcoe street, Toronto, to cost $750,000; W. D. Spengler is the engineer; the Dominion Construction Company, 14 Wellington street, Toronto, are the general contractors. The Consolidated Plate Glass Co., 241 Spadina avenue, Toronto, have been awarded the glass contract in a factory for the Dominion Abrasive Wheel Company, to cost $65,000; Bavington Brothers, 44 Conduit street, have been awarded the painting and glazing contracts; Robert Rennie & Son, 198 Dupont street, has been awarded the roofing contract; A. B. Ormsby, Ltd., 48 Abell street, have been awarded the metal sash contract; the Dominion Bridge Company, Imperial Life building, have been awarded the steel contract: Toms Construction Company, Kent building, Toronto, are the general contractors.

Ottawa, Ont.—Architect J. A. Ewart, Booth building, is preparing plans for a printing plant for The Rolla L. Crain Printing Company, to cost $150,000.

Peterboro, Ont.—Gastine Company, New Jersey, U.S.A., contemplates the erection of a factory; R. G. Johnston, 265 Burnham street (Ashburham), Peterboro, is their local representative.

Toronto, Ont.—J. W. Keens, 68 Spadina road, contemplates the erection of a factory.

Toronto, Ont.—Baines & Peckover, 98 Esplanade street east, have prepared plans for a warehouse at the foot of Cherry street, to cost $25,000.

Toronto, Ont.—Fashion Waists, Ltd., 86 Claremont street, will invite tenders in the spring for the erection of an addition to their factory to cost $8,000. The work on a warehouse for Cassidy's, Limited, 51 St. Paul street west, Montreal, has been postponed until conditions are more favorable.

Toronto, Ont.—Jackson-Lewis Company, Bell Telephone building, have been awarded the general contract for the erection of an aviation plant for the Imperial Government, to cost $200,000; McGregor & McIntyre, 1139 Shaw street, have been awarded the steel work contract; John M. Lyle, 19 Avondale road, Toronto, is the architect.

Toronto, Ont.—The Imperial Munition Board will erect a munition plant at Ashbridge Bay, to cost $3,000,000; J. D. Flavelle, chairman. The Imperial Government has purchased a site at the corner of Dufferin street and Lappin avenue for which to build an aviation plant, John M. Lyle, 19 Avondale road, is the architect. The Imperial Munition Board of Canada, Ottawa, contemplates the erection of a munition plant at the Central Prison site, Strachan avenue. Wells Brothers Company of Canada, Ltd., Church street, have been awarded the general contract for the erection of an addition to the factory of Wm. Davies, 621 Front street east, to cost $5,000. The Turnbull Elevator Company, 126 John street, contemplates the erection of a factory at the corner of Bloor and Lansdowne avenue. Architect W. Williamson, 137 Woodbine avenue, has prepared plans for the erection of an addition to the factory of E. Leadlay & Company, 87 Front street east, to cost $25,000.

Ridgeway, Ont.—The Canadian Chicago Bridge and Iron Co., Limited, contemplates the erection of an addition to their plant at Bridgeburg.

St. Catharines, Ont.—Geo. H. Archibald, 23 Jordan street, Toronto, has been awarded the general contract for the erection of an addition to a factory for the Kinleith Paper Company, St. Catharines, to cost $7,000; The Trussed Concrete Steel Company of Canada, Limited, 23 Jordan street, Toronto, have been awarded the reinforcement contract; Denison & Stephenson, 18 King street, Toronto, are the architects.

St. John, New Brunswick.—Fraser, Limited, Fredericton, contemplates the erection of a pulp and paper plant at Edmundston, Madawaska County.

Wahnapetil, Ont.—The British American Nickel Company, 20 Victoria street, Toronto, is clearing a site for the erection of a power plant along the main line of the Canadian Pacific Railway at Wahnapetil, Ont.

Wiarton, Ont.—Canada Furniture Manufacturing Company contemplates the erection of a factory addition.

Windsor, Ont.—Brenner Brothers, 184 Horton street, London, has purchased a site for the erection of a cigar factory.

Winnipeg, Man.—The Richardson Grain Separator Company, Minneapalis, contemplates the erection of a factory.

Winnipeg, Man.—J. D. McArthur, Winnipeg millionaire contractor, will erect an enormous paper and pulp plant near Winnipeg.

PUBLIC BUILDINGS AND STATIONS.

Fort William, Ont.—The Canadian Northern Railway have selected a site for the erection of a station on Vickers street, to cost $50,000.

Hamilton, Ont.—The Toronto, Hamilton and Buffalo Railways, Hamilton, are preparing plans for an addition to their station on Hunter street, to cost $20,000; R. L. Latham is the architect.

Renfrew, Ont.—The Calabogie Light and Power Company contemplates the erection of a sub-station at Renfrew.

Welland, Ont.—J. C. Diffin, Brennan block, Welland, has been awarded the general contract for the erection of a transformer station for the Welland Hydro Electric Commission, to cost $18,000, on Lincoln street and Hillems avenue.

RESIDENCES, STORES, AND FLATS.

Hamilton, Ont.—Architect E. B. Patterson, 143 Wentworth street, is preparing plans to convert stores into apartments for Ed. Mathews, 221 John street north, to cost $5,000. Miss Edwards, 216 Jackson street west, is having plans prepared to convert a hotel into apartments, to cost $5,000.

London, Ont.—Plans are in preparation for a bungalow for Norman A. Roberts, 155 Ridout street, to cost $5,000.

Oakville, Ont.—Architects Chapman & McGiffin, 95 King street east, Toronto, are preparing plans for a residence for H. G. Kelly, 65 Castle Frank road, Toronto, to cost $20,000.

Ottawa, Ont.—The Corporation of Ottawa contemplates the erection of a detention home on Bronson avenue, to cost $25,000; Mr. McCallum, City Hall, is the architect.

Ottawa, Ont.—Louis Lemieux, 140 Laurier avenue, and Hector Leblanc, Kent street, have been awarded the general contract for the erection of a teachers' residence for Grey Nuns, Ottawa, to cost $45,250; J. D. Cheve, 163 Notre Dame street, Hull, is the architect.

Toronto, Ont.—Alexander McLeod, 57 Benlamond avenue, has been awarded the general contract for the erection of a residence for John A. Brady, 43 Benlamond avenue, to cost $5,500.

Toronto, Ont.—The Ina Grafton Homes, Limited, contemplates the erection of an apartment house to cost $100,000; J. J. Gibson, General Manager, Chartered Trust and Executor Co., Traders Bank building, is the treasurer.

Toronto, Ont.—Saul & Page, 58 Balmoral avenue, have been awarded the general contract for the erection of a residence on Dale avenue for Alfred W. Reid, 87 Pleasant boulevard, to cost $5,500; Harry Payne, 58 Harvie avenue, has been awarded the heating and plumbing contracts.

Walkerville, Ont.—A. Selby, 29 Elliott street, Windsor, has been awarded the mason contract in a residence for F. Porter, c-o American Auto Trimming Company, to cost $5,000; W. Dupuis, 147 Dougal avenue, Windsor, has been awarded the carpenter contract; Pennington & Brian, 47 Sandwich street, have been awarded the sheet metal contract; McNaughton & McKay, 216 Wyandotte street, have been awarded the electric wiring contract; N. Fielding, 53 Devonshire road, Walkerville, has been awarded the heating and plumbing contracts; J. C. Pennington, La Belle building, Windsor, is the architect.

SCHOOLS, COLLEGES, AND CHURCHES.

Chatham, Ont.—The Public School Board of Chatham contemplates the erection of an addition to the McKeough School, and also contemplates an addition of four rooms to Queen Mary's School. The Union School Sections No. 16 Dover and No. 23 Chatham Township, contemplates the erection of a school.

Highland Creek, Ont.—The Board of School Trustees contemplates the erection of a school.

Keene, Ont.—The Board of School Trustees contemplates the erection of a school.

Quebec, Que.—Architect Pierre Tevesque, 115 St. John street, Quebec, is preparing plans for a church for the trustees of St Benjamin, to cost $15,000.

St. Catharines, Ont.—The Niagara Street Methodist Congregation contemplates the erection of a church to cost $25,000.

Quebec, Que.—Table & Roberge, Ste.-Marie, Beauce, Quebec, have been awarded the general contract for the erection of a church for the Trustees of St. Damase, Mataue County, Quebec, to cost $41,350; Pierre Tevesque, 115 St. John street, Quebec, is the architect.

Toronto, Ont.—The Board of Education, 263 College street, contemplates an addition of four rooms to Parkdale Collegiate. The Board of Education, 263 College street, contemplates an addition to Jarvis Street Collegiate.

Architects, engineers and contractors are invited to contribute information on construction work, whether it be proposed or in progress, and such information will be published in these columns.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

Building, Garage, Automobile and Supply Co., Ltd., Toronto, Ont.

Brick, Fancy, Milton Brick Co., Ltd., Toronto, Ont.; Plain, Don Valley Brick Co., Ltd., Toronto, Ont.
Boilers, Gurney Foundry Co., Ltd., Toronto, Ont.
Casements and Window Construction, Henry Hope & Sons, Ltd., Toronto, Ont.
Cement, A. Rogers, Ltd., Toronto, Ont.
Concrete Work, Crescent Concrete Co., Toronto, Ont.
Crane, Herbert Morris, Crane and Hoist Co., Ltd., Toronto, Ont.
Electric Fixtures, McDonald & Willson, Ltd., Toronto, Ont.
Electric Wiring and Apparatus, Bennett & Wright, Ltd., Toronto, Ont.
Elevators, Otis-Fensom Co., Ltd., Toronto, Ont.
Expanded Metal, Baines & Peckover, Toronto, Ont.
Fire Doors, A. B. Ormsby Co., Ltd.
Flooring, Terazzo Floor by Italian Mosaic and Marble Co., Ltd., Toronto.
Glass, Metropolitan Glass Co., Ltd., Toronto, Ont.
Hardware, Springer Hardware Co., Ltd., Belleville, Ont.
Hollow Tile, Sun Brick Co., Ltd., Toronto, Ont.
Oil Burner, Fess System of Canada, Ltd., Toronto, Ont.
Plumbing, Keiths, Ltd., Toronto, Ont.
Plaster Work, E. J. Curry, Toronto, Ont.
Power Machinery and Pump, National Equipment Co., Ltd., Toronto, Ont.
Reinforcing Steel, Baines & Peckover, Toronto, Ont.
Structural Iron Steel, McGregor & McIntyre, Ltd., Toronto, Ont.
Vault Doors, J. & J. Taylor, Ltd., Toronto, Ont.
Water Heater, Ruud Automatic Gas Heater Co., Toronto, Ont.
Water Tank, Ontario Wind Engine and Pump Co., Ltd., Toronto, Ont.

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HUGE ORDER FOR STEEL.

An order has been placed by the architects who are erecting the new mammoth department store at the corner of Yonge and College streets for 13,000 tons of steel. This is for the framework of the immense structure. The manufacturers have received imperative instructions to start delivery at the earliest possible date. The city architect of Toronto recently issued the permit for the first section of the new building, and the plans for the other sections are under examination.

CATALOGUES and BOOKLETS

Garage Door Equipment, published by the Richards-Wilcox Canadian Co., Ltd., London, Ont., is a complete booklet that deals particularly with this important subject. By the use of drawing and illustrations their various products are described. Solutions for the various problems which arise when hanging the garage door are offered. Door schemes for the smallest as well as the largest garage are presented in this catalogue, and described and illustrated elsewhere in this issue. This company maintains a special department, which is prepared to co-operate with the architect in solving any problem that may arise, and blue prints in detail are supplied upon request.

Structural Timber Handbook on Pacific Coast Woods.—The purpose of this book is to present information relative to structural timber, which will be useful to architects, engineers and contractors. Particular attention has been given to Pacific Coast species. A brief description is given of the four principal species of wood found. An effort has been made to present data showing the strength and durability of these woods. Tables show safe total loads on columns of various sizes, and other tables give the maximum spans for mill and laminated floors, board measure for dimensions and lengths, and board measure and weight for unit lengths of Douglas fir dimension timber. A considerable amount of data is presented on the creosoting of Douglas fir lumber in various forms.

Data and figures are given on timber frame-brick mill building, showing costs, insurance rates, and details of construction. Copies of this book may be had by addressing The West Coast Lumberman's Association, 1016 White Building, Seattle, Wash.

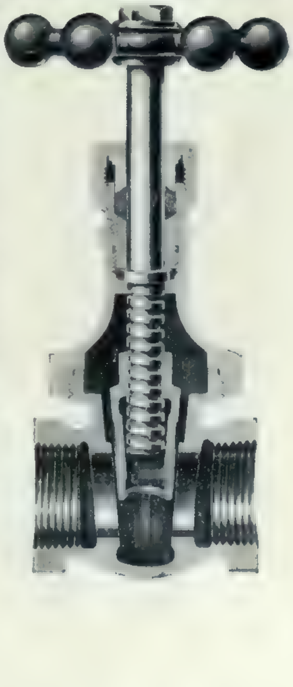
Chemistry and Agriculture.—In the annual report of the Division of Chemistry, Dominion Experimental Farm, for the year ending March 31, 1916, prepared by Frank T. Shutt, M.A., D.Sc., Dominion Chemist, and recently issued by the Dominion Department of Agriculture, considerable attention is devoted to the study of the subject of "Sugar Beets for Factory Purposes."

In this report, Professor Shutt states that this "investigation carried on now a number of years, has conclusively shown that beets of excellent quality for sugar extraction can be grown in many widely distant portions of the Dominion." Among the factors to be considered, in sugar beet growing, are the quality of the beet, labor, with its availability and cost. Considerable space is also given to results of investigations carried on to ascertain the relative value of field roots. The results of these point out clearly that care must be exercised in selecting the variety, or varieties, of field roots grown. In the analysis of some thirty-six varieties of mangles the richest root contained 13 per cent. dry matter and 5.66 per cent. sugar, while the poorest contained 7.32 per cent. dry matter and 2.86 per cent. sugar. These great and important differences represent real differences in feeding values. The same is true with turnips, analysis, showing that between the richest and poorest of some thirty-three varieties there existed a difference of 5.58 per cent. dry matter, which, assuming that the feeding value is measured by the percentage of dry matter, means that two thousand pounds of the best variety are equivalent to three thousand eight hundred and sixty pounds of the poorest. Further investigations were carried on with regard to fodders and feeding stuffs, and a large number of fertilizing materials were analyzed during the year. The report also contains the result of investigational work with fertilizers conducted by supervisor, B. Leslie Emslie, on the Experimental Stations at Fredericton, N.B., and Kentville, N.S. This report, which contains much valuable information, can be obtained on application to the Publications Branch, Department of Agriculture, Ottawa.

Bulletin No. 1017, Intercommunicating Telephone Apparatus.—The unprecedented high cost of line construction and maintenance materials is causing telephone companies to spend more time on intensive development of territory now served with wire facilities than upon expansion into new fields of operation. There is reported an increasingly large demand for intercommunicating telephone equipment, designed for use in factories, business houses and residences, with connections to the telephone company's exchange. The class of service furnished is very attractive to the operating company, as the rates earned are in higher proportion to the capital investment than for regular subscribers' station service. The Stromberg-Carlson Company furnishes instruments, cables and accessories in six, twelve, twenty-two and thirty-two station sizes, and three types of telephones, viz., wall, desk and combination types. Each telephone is fitted with the same standard type apparatus used in regular subscribers' station equipment, except that the signaling between the local stations is of the battery call type employing direct current vibrating ringers. The equipment of each telephone includes a three-position switching key with the required number of buttons for selecting and calling all other stations and the exchange. It is only necessary for the user of the telephone to press a button once to connect with the line wanted and to ring the desired station. The key buttons interlock by means of a tumbler plate and are restored to normal whenever any other button in the same key box is depressed. To answer a call one presses the home station key button and responds in the usual way. The system operates from two sets of dry cells, each set having a voltage of from nine to fifteen volts, depending upon the size of the system. In buildings wired with alternating current, a bell-ringing transformer may be used in place of one set of dry cells for furnishing the ringing current. Full metallic wiring between all stations is carried in waxed core cables made especially for this service. The cables are furnished in two types, with painted braid or lead covering. The cables and apparatus are cross-talk proof, and any number of connections up to the carrying capacity of the system can be established at the same time without interference through cross-talk, cross-ringing, or other inductive effects. Complete instructions are furnished with each system which simplifies the work so that an electrician with no previous telephone experience can easily install the apparatus in proper working order. The complete equipment for systems of this type, as well as that required for systems having no exchange connections for private installations, is illustrated and described in the Stromberg-Carlson Telephone Mfg. Co.'s "Bulletin No. 1017," which will be sent free upon application to the Toronto office, 110-12 Church street.

Valves and Steam Specialties, Catalogue No. 25, issued by the Penberthy Injector Company, Limited, Windsor, Ontario. This catalogue describes in detail, the steam specialties and valves manufactured by this company. Particular attention is called to Compodisk valves, which are designed with external thread construction, this method preventing straining of body, stripping of threads, makes the connection non-corrosive, and permits the valve to be easily taken apart. It is claimed these valves are a decided improvement over the ordinary type of composition disc valves. Practical information regarding automatic injectors, lubricators, ejectors, and brass specialties is given in a comprehensive manner, and by the liberal use of cuts and drawings, necessary and useful information is presented.

This company have lately added a gate valve to their list of products. This gate valve is designed along the same lines that characterize their other line of valves, and embodies the same feature, the external thread construction, which refers to the method of fastening the bonnet to the body of the valve. This construction is conceded to be superior to the old method of screwing the bonnet into the inside of the valve, as it is impossible for the threads at this connection to become corroded, and the valve is always accessible, and can be taken apart at any time without the liability of straining it. This feature also prevents the enlargement of the bonnet end of the valve causing loose-fitting threads and permits of a more compact valve body, consequently a stronger one. The disc employed is a solid wedge type which eliminates the trouble found in the split disc design. All gate valves manufactured by this company are registered and approved by all Provinces. Literature of interest to all users of steam goods will be mailed upon request.



PERSONAL.

Ross & Macdonald, architects, have moved their offices from 908 Royal Bank Building to 61 Front Street West, Toronto.

G. Jacques & Co., architects and engineers, of Windsor, Ontario, have moved their offices in that city from 5 Sandwich street west, to the Peninsular Security Building, Chatham street west, and would be pleased to receive manufacturers' samples and catalogues.

Mr. Frank A. Spangenberg, who has been associate of Mr. C. S. Cobb for the past three and a half years, is leaving for Buffalo, N.Y., where he will be located with Messrs. Lansing, Bley, & Lyman. Mr. Spangenberg's architectural experience has been gained through association with some of America's foremost firms, covering a period of thirteen years. In the year of 1909 to 1913 he studied architectural design in Atelier Prevot, New York City, and Columbia University. In 1913 Mr. Spangenberg was chief designer and chief draughtsman for Austin W. Lord, architect, Isthmian Canal Commission (of Lord & Hewlett, architects, New York City). His work in Toronto has been particularly devoted to the National Sanitarium Office Building, the new Registry of Deeds and Land Titles, the W. J. Gage residence, and the C. S. Blackwell residence.

CHANGE IN MANAGEMENT.

Changes in the management of MacKinnon, Holmes & Co., Limited, of Sherbrooke, Que., have recently taken place, caused by the retirement from the company of Mr. A. R. Holmes, who in the past has occupied the position of director and secretary-treasurer.

It is understood that Mr. J. W. Bowman, president, and Mr. G. D. MacKinnon, vice-president and general manager, have purchased the holdings of Mr. A. R. Holmes and his friends, and new directors, in the persons of Dr. A. W. Klein, of Greenwich, Conn., M. L. MacKinnon, and J. Nicol, of Sherbrooke, Que., have been elected with Mr. F. C. Johnston, secretary-treasurer.

The business will be conducted as in the past under the management of Mr. G. D. MacKinnon, and it is understood the company is making extensive plans for future development.

This company has been particularly successful in its general business of structural steel and steel plate work, having one of the most complete plants in the country for these special lines. It has also been successful in the forging of shells for the Imperial Munitions Board, having a very complete and up-to-date plant for this special work.

INVESTIGATIONS OF GRAVITY AND ISOSTASY.

Recent investigations of gravity and isostasy are discussed and summarized in Special Publication No. 40 of the United States Coast and Geodetic Survey, a quarto volume of one hundred and ninety-six pages illustrated by numerous plates and charts.

The survey for a number of years has been carrying on geodetic investigations of isostasy with special reference to the effect of isostatic compensation upon the deflection of the vertical and the intensity of gravity. Four previous reports on these investigations have appeared, the first one in 1909 and the last in 1912. The present volume gives the results of further study of the relation between gravity and isostasy. In it are embodied the gravity data resulting from the previous work.

The conclusions which may be drawn from the investigation reported in this volume substantiate to a great extent the conclusions arrived at from previous investigations. This is considered important because seventy per cent. more gravity stations in the United States were used at this time than in the preceding gravity investigation, and many stations in Canada, India, and Europe for which data were available were also used. Copies of the volume may be obtained at sixty cents each from the Superintendent of Documents, Government Printing Office, Washington, D.C.

CONTRACT AWARDED.

The British Cordite Co., Ltd., have recently executed a contract for ten 400 h.p. Murphy furnaces to be installed in their new plant at Nobel, Ont.

INSTRUCTIONS TO STEEL INSPECTORS IN THE FIELD.

By Elwyn E. Seelye.

The purpose of this article is to bring out the essential points to look for when inspecting a steel frame.

It is assumed that the structure has been properly designed and that the shop work has been properly executed. It should be emphasized at this point that shop inspection and mill inspection are very important. The reasons for that are numerous. Some of the most important of them are as follows: Where steel is being rolled and some orders are being inspected the rejected material is apt to be unloaded on the purchaser who does not have inspection. In fabricating, if there is no inspection, the plans may not be followed accurately, causing delay and expensive field changes at the site, also, as will be noted later in the article, certain errors of fabrication are not apparent after the fabrication is complete.

Now presupposing the steel has been shipped in perfect order and is arriving on the site, the inspector should first look it over for damages, due to shipment. These will generally appear as bent plates or members. All these damages should be rectified by straightening, and, if necessary, by reinforcing, before the erection is allowed to proceed. If damage is serious an expert should be called in to pass on it. Where no shop inspection has been made, the field inspector should go over the riveting and see that surfaces in direct bearing are milled and in contact.

The important thing in the erection of bases, either grillages, steel plates or cast iron, is to see that they are properly grouted. This can best be done by pouring the grout into a funnel raised high enough to produce a hydraulic pressure. The space between the concrete foundation and the iron should also be rodded to eliminate voids. It is very important that the bases be set level, faced on the top and that the column be faced to provide a full and even bearing between the bottom of the column and the base. In unimportant columns a discrepancy may be wedged with thin steel wedges, but in important work the full bearing without wedging should be insisted upon. This facing or milling can be done with great accuracy and its omission on bearing surfaces is cause for rejection of the member.

When the erection starts the inspector should keep in mind the functions of the connections and the way the stress is carried from one member into another. This will put him in a position to check the work up in a practical manner. For instance, he will notice that some steel beams rest upon seats which were riveted up in the shop. The additional rivets are really for the purpose of holding the beam in place and not to take a load. Other connections will be directly from the beam through the connecting angles to the column or girder by means of rivets. It will readily be seen that the rivets in this last connection are very much more important and should be more carefully inspected than the field rivets in a seat connection.

The inspector should bear in mind that a rivet is supposed to hold by its shearing and bearing values, but that it also performs a very important function if tight, by holding the two surfaces together and producing a large frictional resistance between the plates. He should also remember that the process of riveting induces a certain amount of internal tension in the shank of the rivet and thereby renders the rivet unreliable for additional tensile strains, and, therefore, bolts with lock nuts should always be substituted for any rivets that are supposed to act in tension.

Having pointed out the essentials of having a tight rivet, the question is how to get it. It is absolutely necessary to inspect steel work before riveting and see that the holes in the plates are concentric, for if a rivet be driven with one-eighth inch eccentricity, it may be a very poor rivet, but it may be tight, and therefore impossible to detect after the riveting is complete. I would say that all differences of eccentricity of over one-sixty-fourth of an inch should be reamed, although this practice might be made less rigorous on unimportant rivets. The use of a drift pin to make the holes concentric by forcing action is to be condemned. In the same way the cutting of extra holes by means of an electric or other torch is to be severely condemned. Having inspected the joint and found the holes concentric, the riveting may proceed. If the rivet is tight and the head full, it should be passed, but if it is loose it should be cut out. Here again, the riveting should be closely watched, as a rivet may be inadequately tightened up by what is known as calking, which consists of the use of a hammer and chisel, wedging the rivet head. The rivet may have the fault of too short a stock and the heads will be flat. This should not be confused with heads which are purposely flattened or countersunk for clearance. Another method of ineffectually tightening the rivet head consists of raising the plate surface under the rivet by driving the rivet snap sideways against the plate. Hence where the plate has been injured or shows a ridge around the rivet the rivet should be cut out.

Cold-hammering of heads should never be allowed. It is easy to detect this because a smaller snap is used on a head when cold-hammered.

The testing of a loose rivet can best be done with a small hammer. Place the finger on the opposite head while striking. Also strike the rivet head up and then down and note if there is any vibration.

A small tile hammer with a personal die cut in the head by annealing it soft and hard again will serve the purpose of surely marking defective rivets.

Another duty of an inspector is to see that the size and weights of beams called for on the plans are furnished. Owing to the Bethlehem and standard shapes having a number of different weights, the flanges should be carefully scaled to detect any substitutes. Where a beam or girder rests upon a wall, care should be taken to see that it is amply supported by the masonry and anchored thereto.

Painting is a very important matter in the preservation of steel work, and all portions where paint has been removed by shipment should be repainted before erection. The field coat should be of different color than the shop coat.

Cast iron members should be carefully inspected for visible defects.

All cast iron columns should have at least two holes drilled in the column for the purpose of checking the thickness of the column. Often the core is displaced in pouring, rendering the column thinner on one side than the other. A discrepancy of more than twenty-five per cent. should be cause for rejection.

All bearing surfaces in cast iron should be milled. Columns which are crooked should be rejected.

The cast iron beam seats should slope down outwards to make the beam bear as close as possible to the column and eliminate flexure in the seat.

A double lug generally engages the web of a beam through which a single bolt is passed. On one job these bolts held the beams up off the seat and necessitated field changes.

All steel should be marked for identification in the field and the shop inspector's mark should also appear. The most intelligent field inspection can be made by a representative from the designer's office, as he will be able to follow the designer's intent.

The inspector should co-operate with the erector in safeguarding the structure from accidents during erection. He should see that the derrick base is secured from the horizontal kick of the boom in any direction. The steel carrying the derrick should be strong enough and have sufficient connections for the erection stresses involved. He should exert a check on dangerous practices, such as lifting too heavy a load for the strength or counter-ties of the derrick, booming out too far or the splicing of booms.

Guying and bracing of steel in the process of erection against wind-bracing is important. In this case it is well to remember that serious accidents have occurred through the shrinkage of guy ropes when wet. To sum up:

1. See that your steel is inspected by a competent bureau in the mill and shop.
2. See that your bases have a proper masonry contact.
3. See that columns bear directly on bases with full bearing; that columns bear directly on columns with full bearing and that all stiffeners are milled to bear.
4. See that the steel is repaired and straightened where injured during shipment.
5. See that no rivets are in tension.
6. See that all rivets are tight and driven in concentric holes.
7. Look out for a good two-coat paint job.
8. Be sure that beams have proper wall bearing.
9. Inspect cast iron for workmanship and flaws.
10. Safeguard the erection against accidents.

CONSTRUCTION

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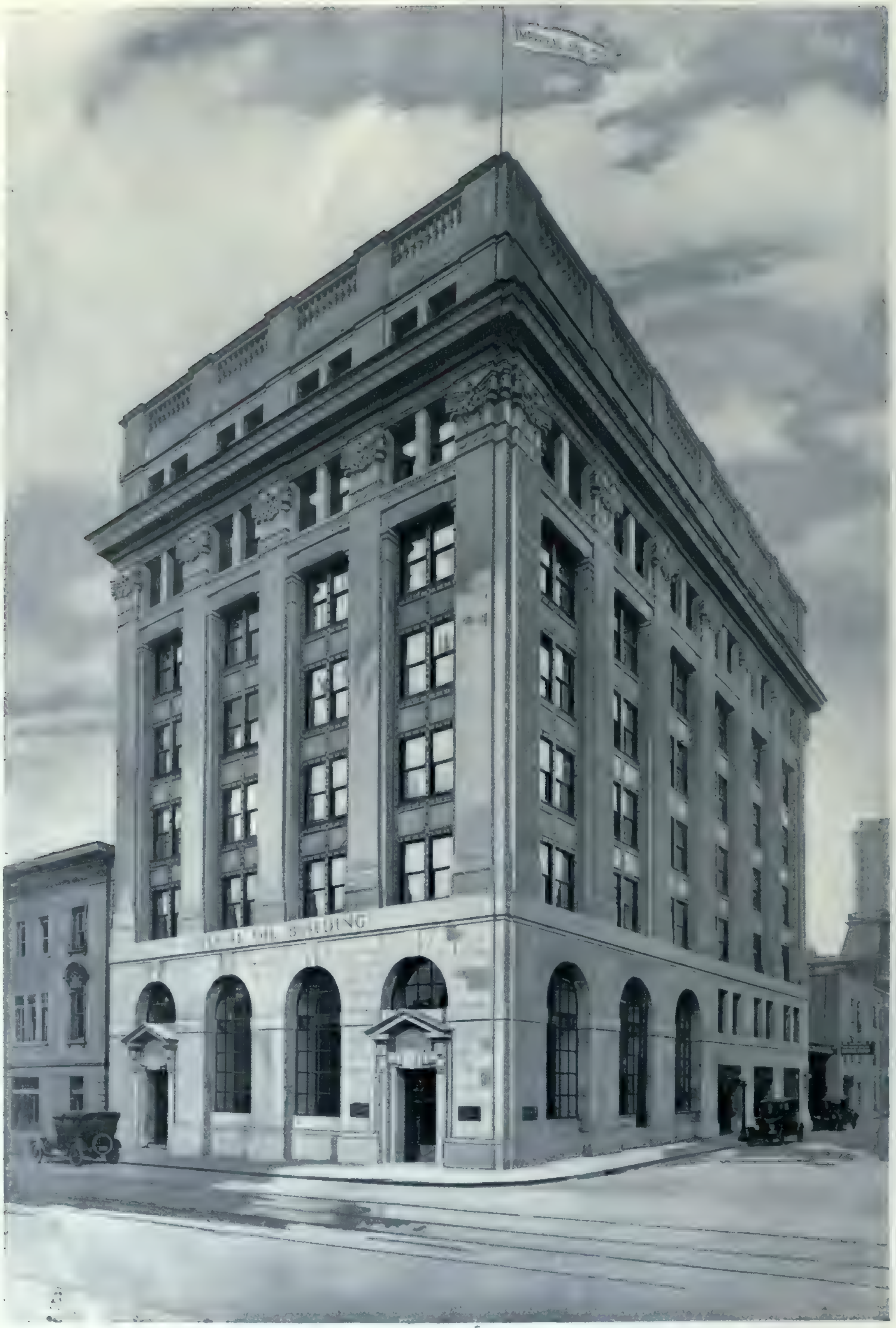


IMPERIAL OIL BUILDING, TORONTO, ONT.

CLINTON & RUSSELL, ARCHITECTS; J. L. HAVILL, RESIDENT ARCHITECT.

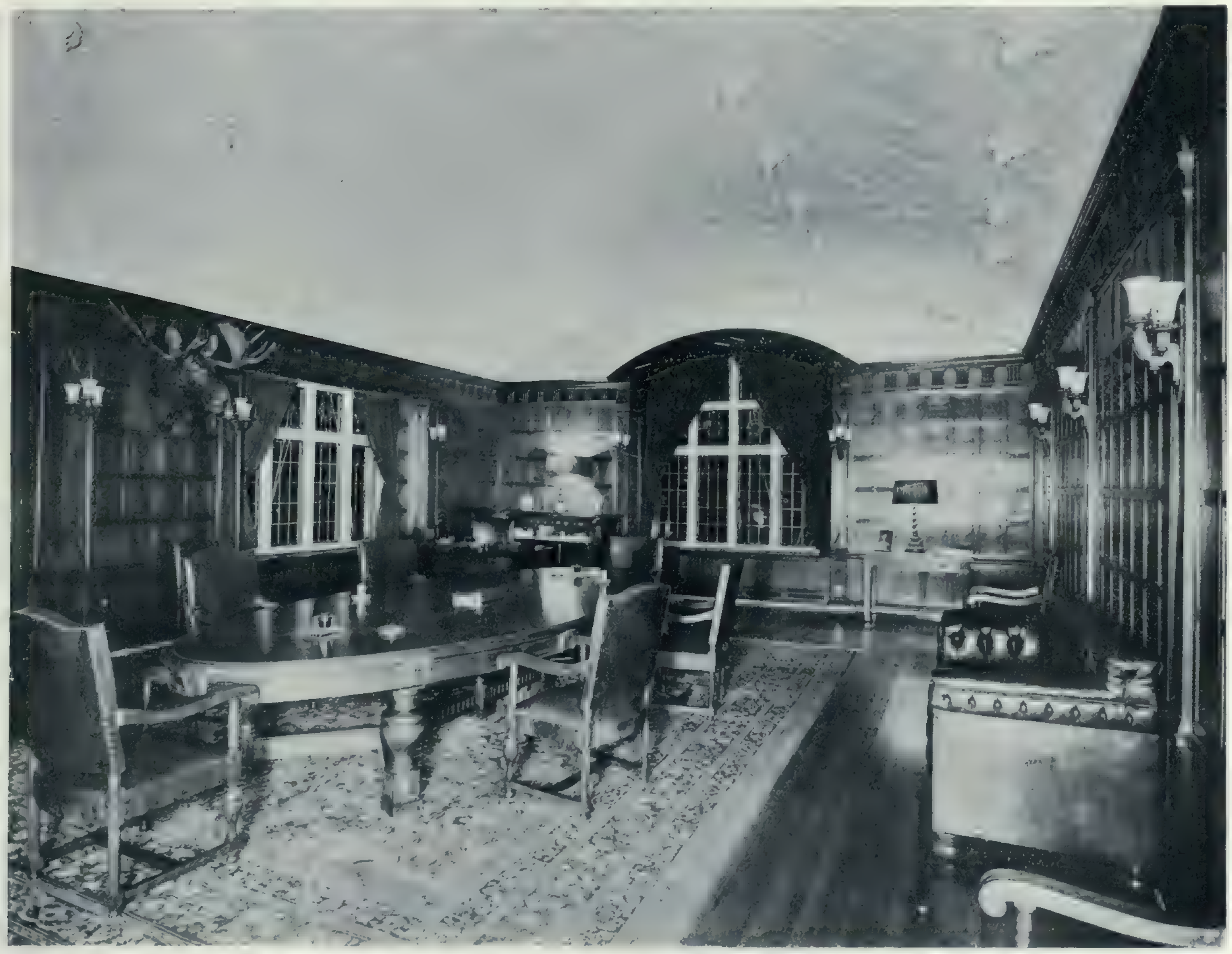
The Imperial Oil Building, Toronto, Ontario

Imposing Steel Structure Faced With Lime Stone. The Latest Addition to Toronto's Office Structures. Splendidly Equipped and Modern in Every Detail.

THE Imperial Oil Company's building is an eight-story office building, erected on the south-west corner of Church and Court streets, Toronto.

What undoubtedly will appeal to the residents of Toronto, and visitors, is the handsome exterior of this building, the style being an adaption of the Italian Renaissance.

From sidewalk to coping the Church and Court street elevations are of buff Indiana limestone, and the rear and Court elevations of buff pressed brick.



VIEW OF BOARD ROOM, IMPERIAL OIL BUILDING, TORONTO, ONT. CLINTON & RUSSELL, ARCHITECTS; J. L. HAVILL, RESIDENT ARCHITECT.

The window frames and sash, except on the ground floor fronts, which are of steel, are of wood covered with fourteen-ounce bronze on the two street fronts, and of hollow steel on the rear and the court elevations. The sash are all carefully weather-stripped, and are weather and wind proof. All window glass is plate, except on rear and in Court elevations, where clear plate wire glass is used.

The roofs are covered with tile, and all exterior metal work is of copper.

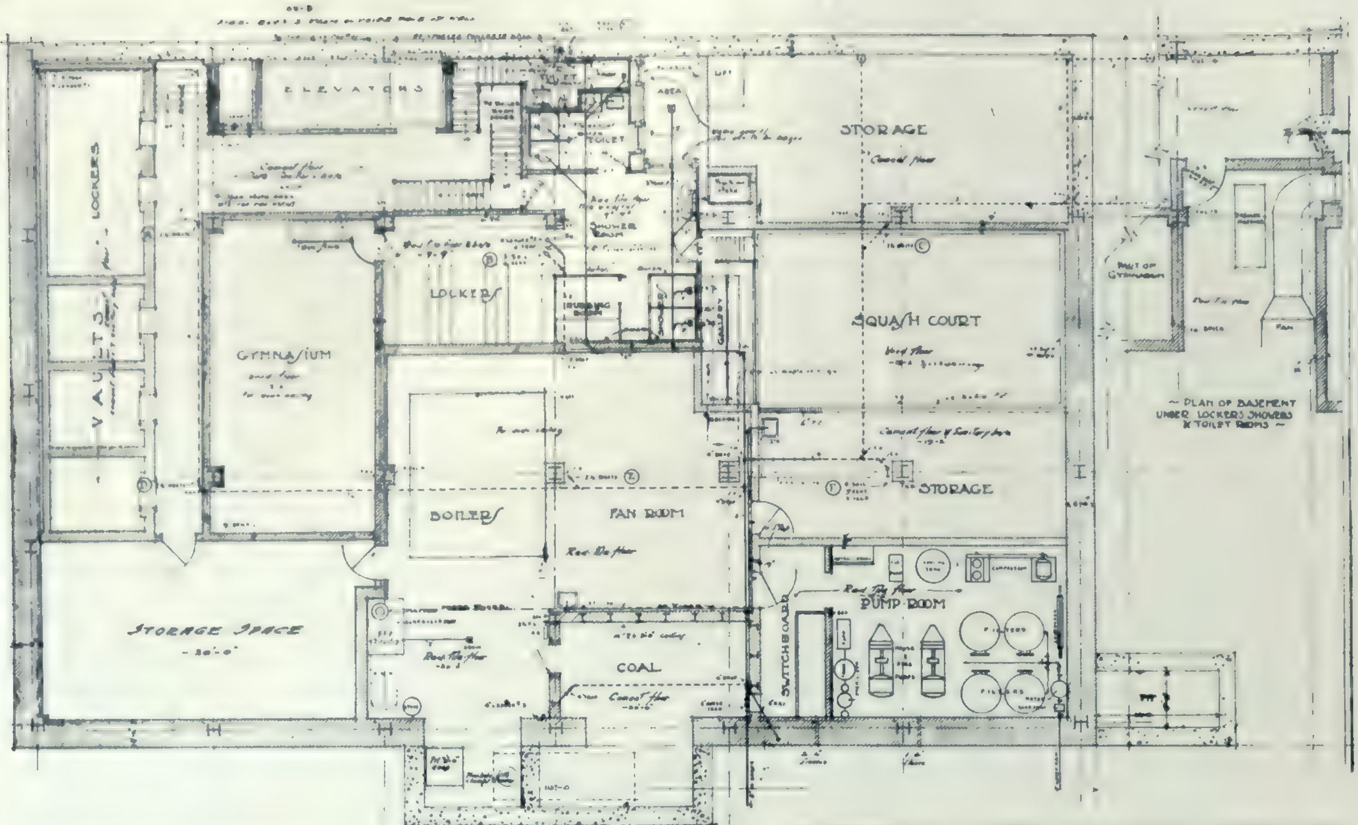
The tenders for this building were received up to 1 p.m., November 22nd, 1915, and at 4 p.m. the same afternoon the general contract was awarded to the lowest tender.

Work was commenced a week later on the excavation for the basement, which is a depth of twenty feet below the level of the curb.

The column foundations are on rock at an average depth of thirty-two feet ten inches below curb level.

This part of the contract was carried on and concrete footings put in during the months of December and January, and the erection of steel was commenced February 28th, 1916.

The rapidity with which the erection of the steel frame and exterior steel work progressed is shown by accompanying progress photographs taken on March 2nd and April 25th, 1916.

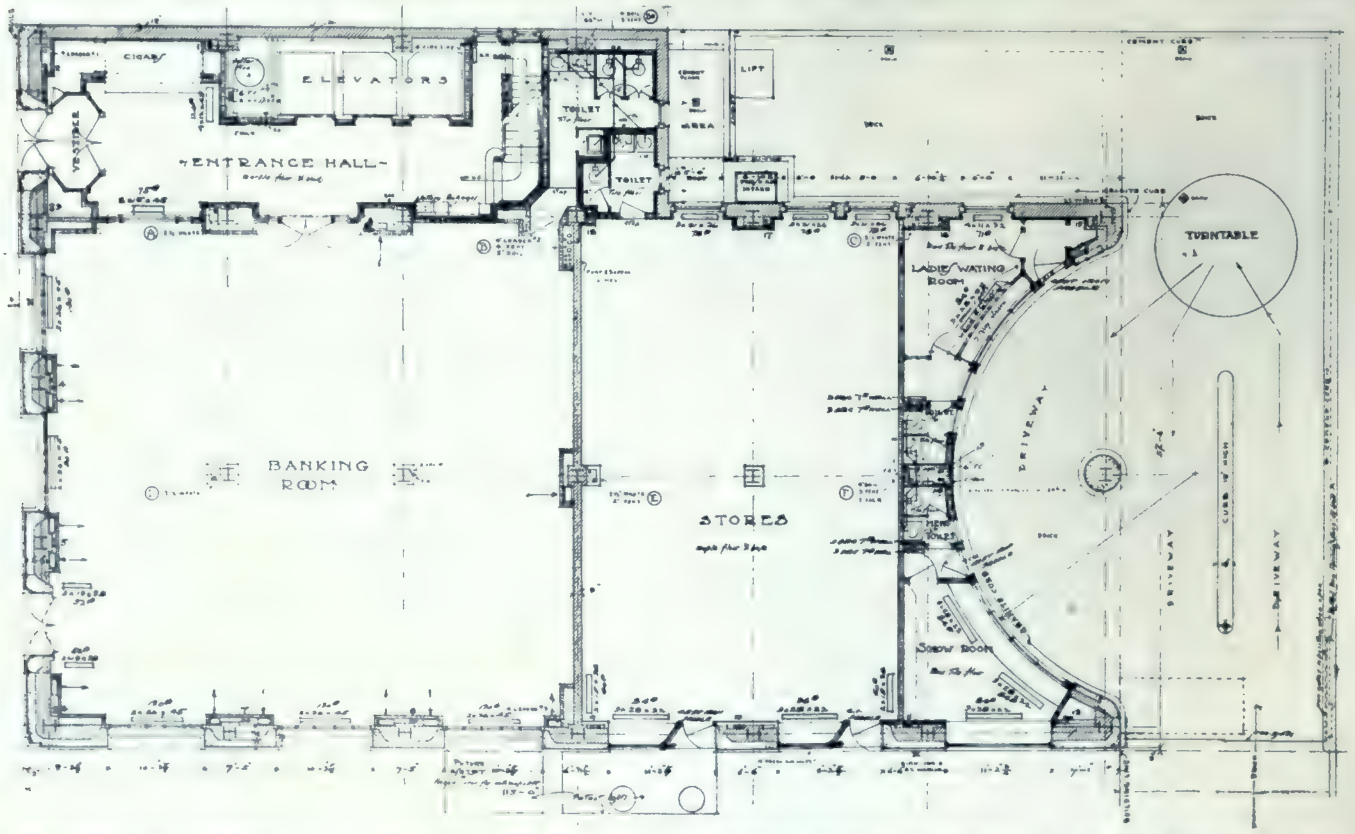


BASEMENT PLAN, IMPERIAL OIL BUILDING, TORONTO, ONT.

The contract for completion of the building called for July 23rd, 1916, and the tenants commenced to move into the building about this time and were really settled in their offices the first week in August, 1916.

Before the plans were started a careful estimate of the situation was made by the architects; the heads of all departments were consulted and sketches prepared and changes made from time to time. The very excellent advice of Mr. G. L. Olney, of Cleveland, was sought, and in connection with all departmental heads, working through their president, Mr. Walter Teagle, definite plans were finally made and the contract awarded for the execution of the work. After due consideration, it was decided to award the most of the sub-contracts to local men, and this policy turned out to be most satisfactory.

The general contractors at once established



FIRST FLOOR PLAN, IMPERIAL OIL BUILDING, TORONTO, ONT.

CLINTON & RUSSELL, ARCHITECTS; J. L. HAVILL, RESIDENT ARCHITECT.

a local office in Toronto, with experienced men who took charge; everything functioned so well that the building was completed on time, and within the estimated cost. Great credit must be given the Canadian sub-contractors for their diligence and excellent work. The problem was really a most easy one to solve. Given a certain lot area, easements to adjacent property for light and air, the planning was easy.

In the basement is contained the mechanical equipment, consisting of two water tubular boilers, equipped either for coal or fuel oil consumption, the pumping, ventilating, filtering refrigerating and hot water plants, and a large storage space for both coal and oil.

In the basement there is also a standard-sized squash court, a gymnasium, locker rooms, shower baths and lavatories to accommodate the tenants, who have organized The Imperial Club and use these quarters constantly.

The ventilation of the basement and the banking room on the first floor is by a large motor-driven fan in the basement, the air being drawn from the rear court through water screens, and delivered through ducts to the various rooms. All toilet rooms throughout the building are also ventilated through ducts to a fan located on the roof.

On the first floor is located the main entrance on Church street, a branch of the Royal Bank of Canada, a room about fifty-two feet square and twenty-four feet in height and fully equipped throughout.

There are two stores on Court street and a display room of the Oil Company. The driveway and service station in the rear of the building is a feature. The entrance to service station from Court street is twenty-one feet in width, and at the extreme end of the driveway is a fifteen-foot steel turntable, which is easily manipulated, and with its in and out passages, as shown on the accompanying plans, is easily accessible.

The service station is entirely covered with a large steel and glass roof, which is much appreciated by the automobile public.

In the centre of driveway is located the gasoline and oil pumps, so arranged that four automobiles can be served at one time, and it is the most modern filling station in the Dominion of Canada.

Rest rooms have been provided for both men and women, and every convenience can be found there.

There has also been installed a free air station just outside the service station on Court street.

In fact, the covered driveway and its adjoining partly covered court yard is one of the most unique and at the same time, practical features of the construction.

The upper seven stories of the building contain the offices of the company and some space rented to other tenants.

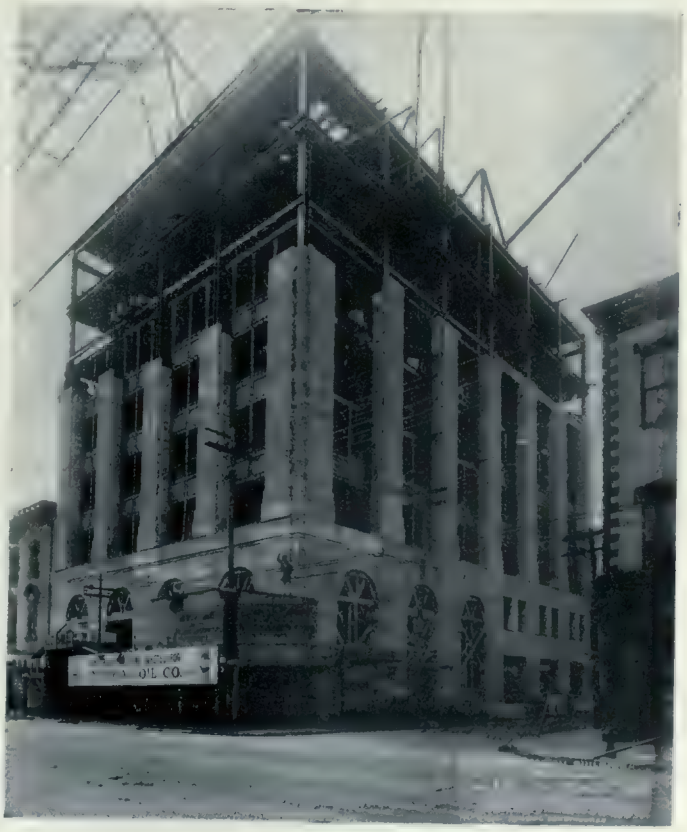
PROGRESS VIEW OF WORK, MARCH 2ND, 1916.

The main entrance hallway is trimmed throughout with bronze and tavernelle marble and Tennessee marble floor; banking room, Tennessee marble floor, boulder grey wainscot.

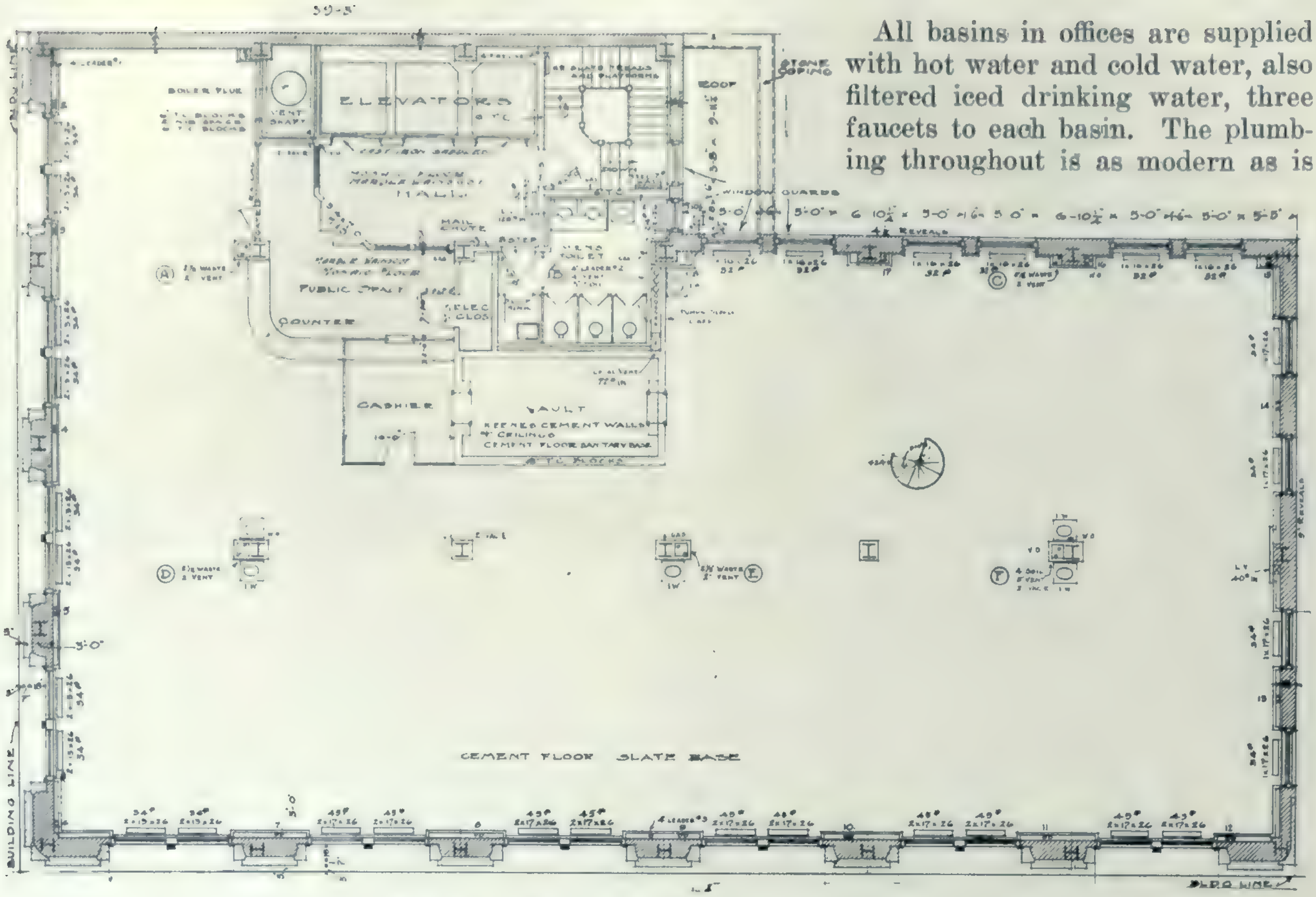
Above the first story, the elevator fronts and stairways are of cast iron, and all doors, trim, chair, rail, picture and wire moulds throughout are of steel with paint and enamel baked on to represent mahogany.

The floors of all offices are of cement, and the base of slate.

The halls and corridors have boulder grey marble wainscot four feet six inches in height and Terrazza floors.



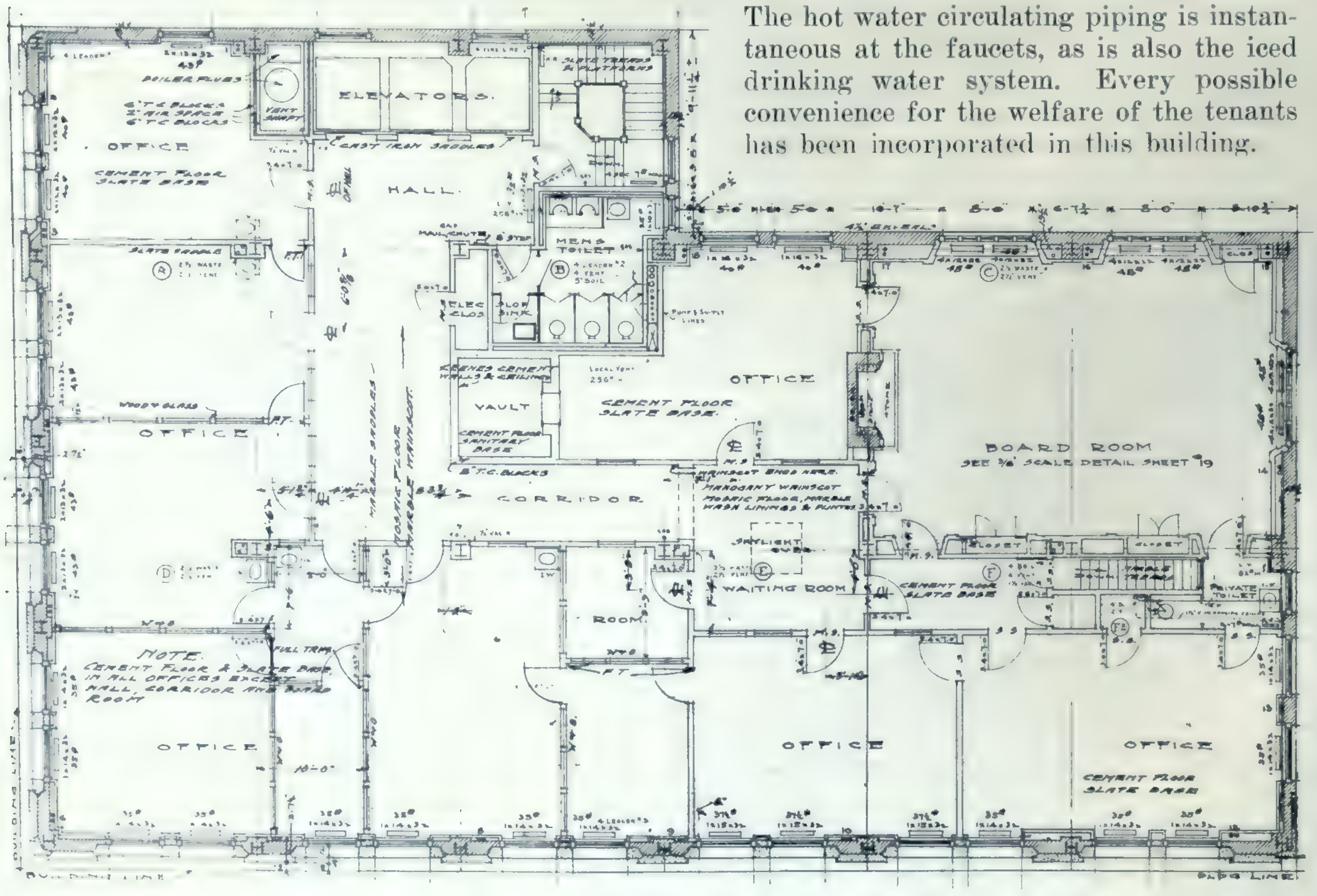
PROGRESS VIEW OF WORK, APRIL 25TH, 1916.



THIRD FLOOR PLAN, IMPERIAL OIL BUILDING, TORONTO, ONT.

Stairways are enclosed in fireproof partitions, and cast iron elevator fronts are glazed with clear plate wired glass. All toilet rooms have tiled floors and walls, and marble partitions.

All basins in offices are supplied with hot water and cold water, also filtered iced drinking water, three faucets to each basin. The plumbing throughout is as modern as is possible in sanitary practice. The plumbing fixtures are all of porcelain with heavy nickel-plated brass fittings and piping, self-closing faucets, valves and other modern appliances. The hot water circulating piping is instantaneous at the faucets, as is also the iced drinking water system. Every possible convenience for the welfare of the tenants has been incorporated in this building.



EIGHTH FLOOR PLAN, IMPERIAL OIL BUILDING, TORONTO, ONT.

CLINTON & RUSSELL, ARCHITECTS; J. L. HAVILL, RESIDENT ARCHITECT.

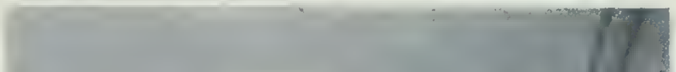
INTERIOR VIEW OF MAIN ENTRANCE.

There is a complete fire appliance system, water lines, hose and racks, pumps, 5,000 gallon tank in roof house, and exit lights to all staircase door openings, fire alarm system, Siamese hose connections for fire engines on both Court and Church streets.

The building is heated throughout by steam, and the radiating surface is so designed and distributed as to heat all parts of the building to 70 degrees in 10 degrees below zero weather.

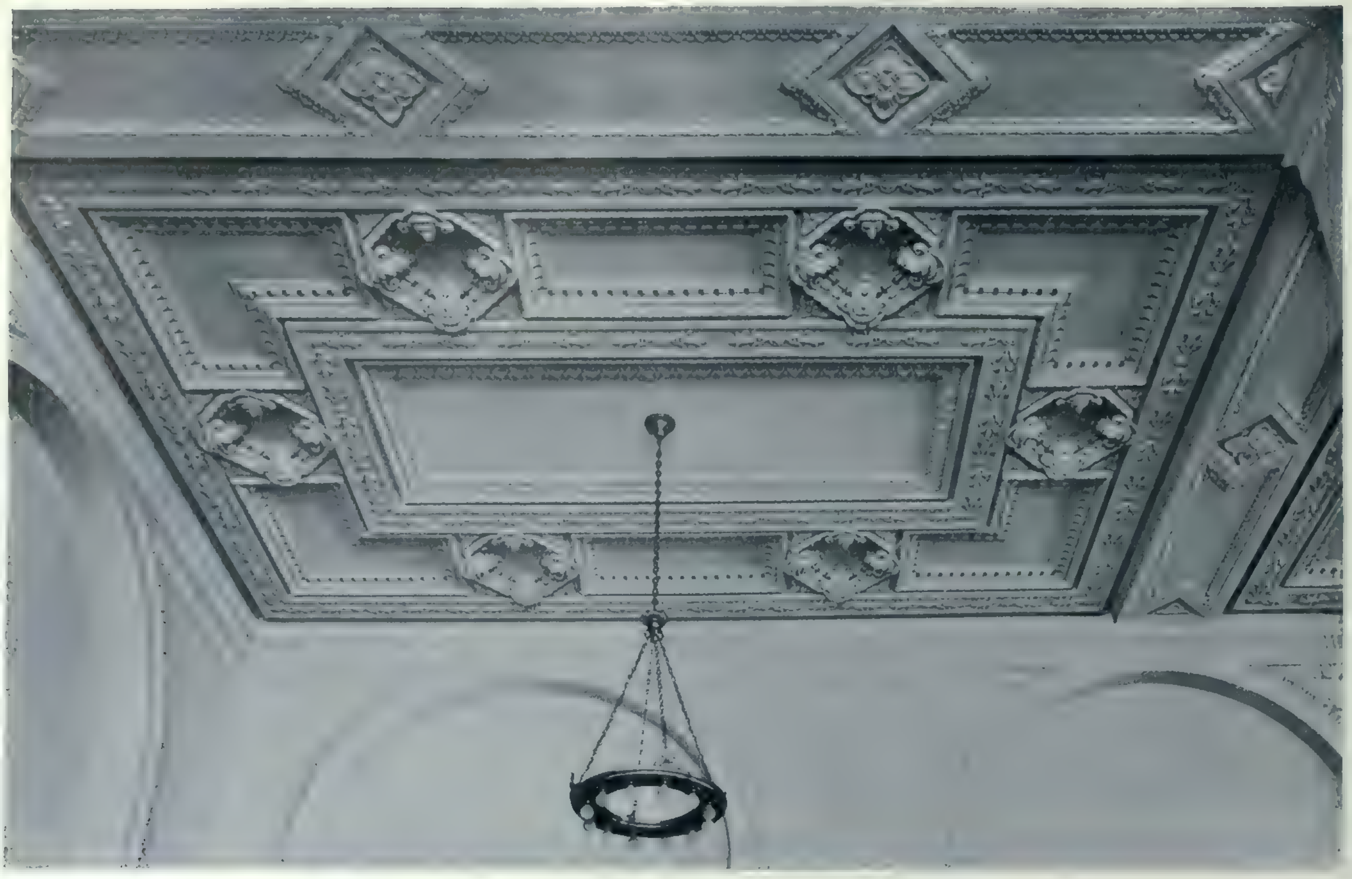
The first floor and portion of the basement are heated by means of heaters and reheaters with air forced through by a fan as hereinbefore described. All return valves are of the vacuum type. The heat in the board room on the eighth floor and the banking room on the first floor is controlled by temperature regulation.

The electrical layout was given most particular consideration. In the arrangement of lighting for the general offices throughout the building, the lighting fixtures were designed and calculated to give sufficient and splendidly distributed light throughout the various rooms, so that none of the clerical force have been obliged to use portable desk lamps. Whilst this building is wired to base receptacles, none of them are used.

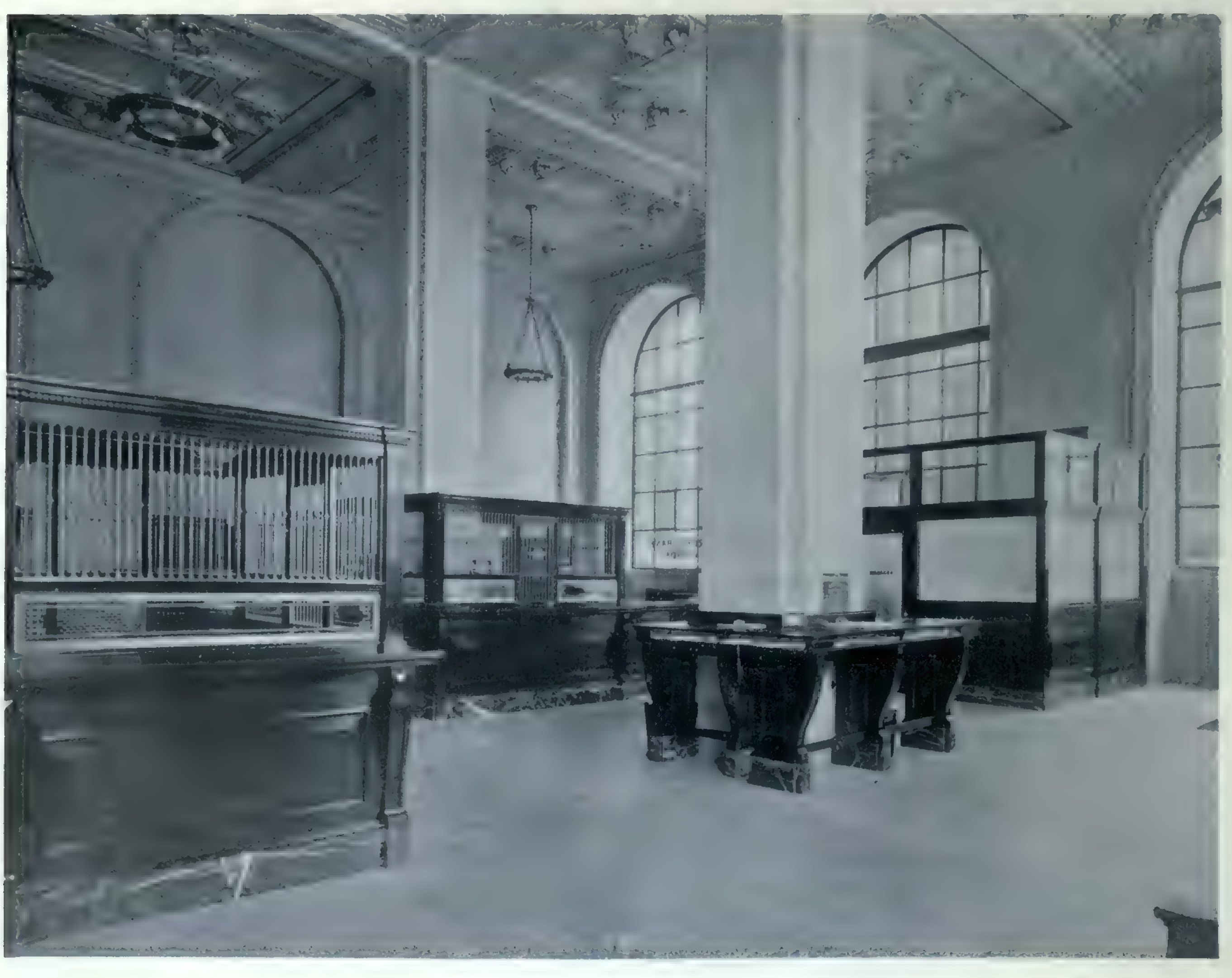


VIEW OF MAIN ENTRANCE HALLWAY.

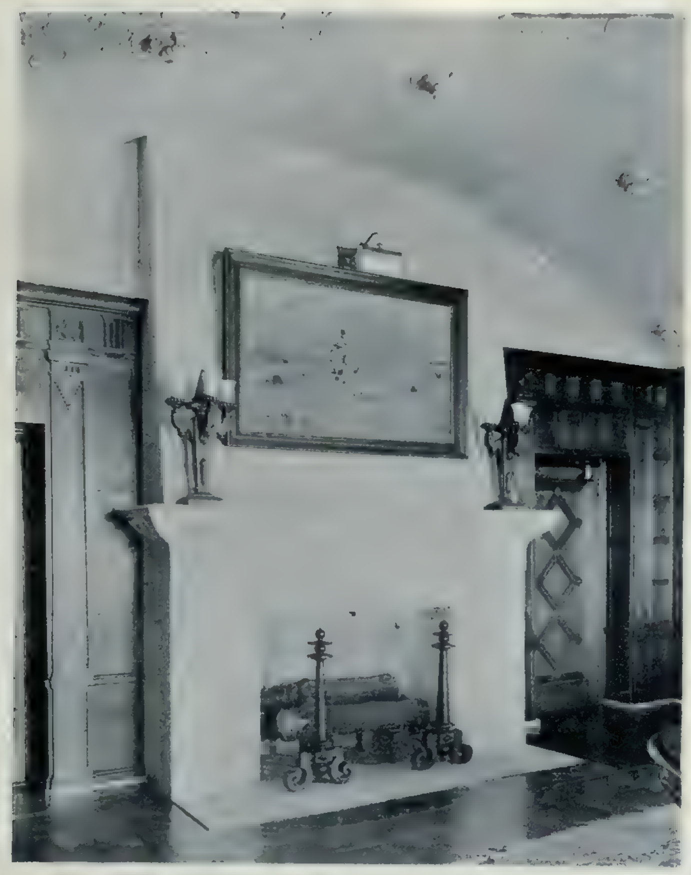
VIEW OF ELEVATOR ENTRANCES, MAIN FLOOR.



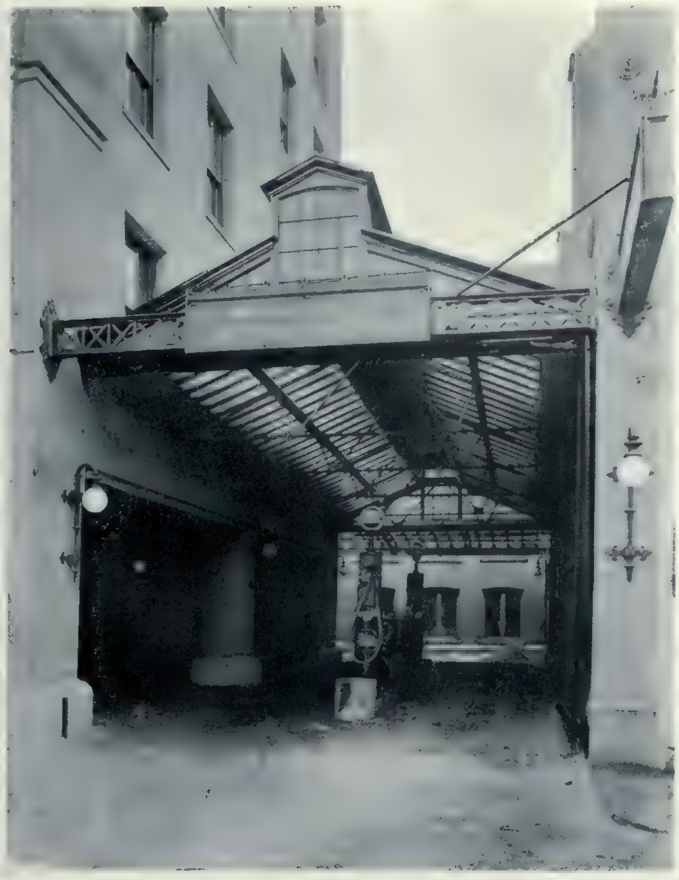
CEILING DETAIL, BANKING ROOM, IMPERIAL OIL BUILDING, TORONTO, ONT.



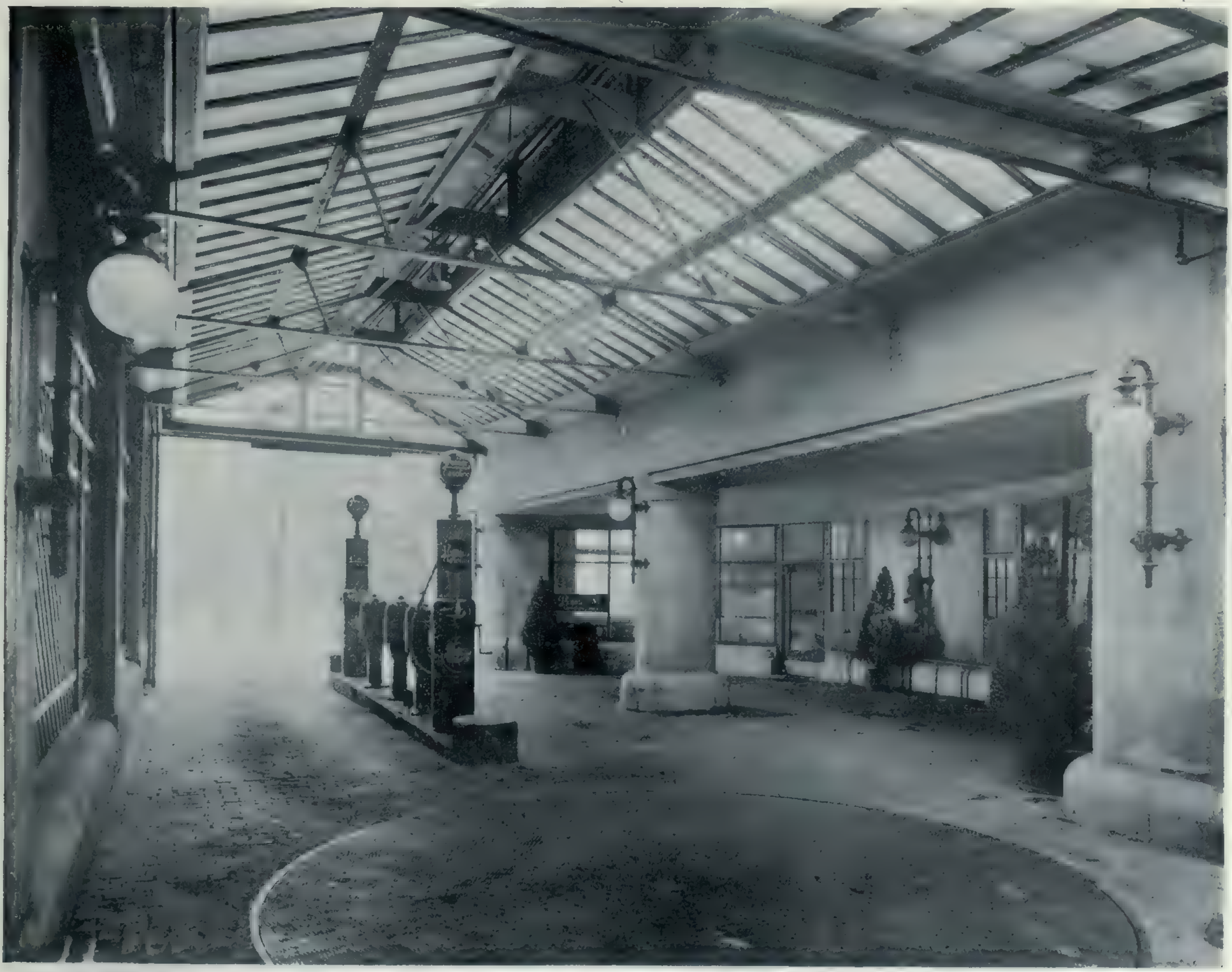
VIEW OF BANKING ROOM, IMPERIAL OIL BUILDING, TORONTO, ONT. CLINTON & RUSSELL, ARCHITECTS; J. L. HAVILL, RESIDENT ARCHITECT.



INTERIOR VIEW SHOWING ENTRANCE TO BOARD ROOM AND FIREPLACE.



ENTRANCE TO SERVICE STATION.



VIEW OF SERVICE STATION, SHOWING TURN TABLE, OIL AND GASOLINE PUMP, IMPERIAL OIL BUILDING, TORONTO, ONT.

VIEW OF LADIES' WAITING ROOM IN SERVICE STATION.

The building is also wired completely with a low tension system both for bells and dictagraphs, telephones and telegraph. The electric light and elevator current are taken from street service, 110 volts for lights and 240 volts for elevators, both direct current. There are three high-speed duplex worm gear traction elevators, with machines set overhead in pent house on roof. They are completely equipped with modern flash light stop systems and with every modern safety appliance known to the art.

GENERAL VIEW OF OFFICE FLOOR.

The board room on the eighth floor is a feature of the building. It is an English room in every respect. The floor is of quartered oak; the walls are panelled with English oak to the ceiling. The ceiling is arched and simply but handsomely decorated. The three large windows have steel frames and sash of English manufacture, divided into small panes of leaded lights of clear glass; the mullions of windows are of limestone. The handsome fireplace in the east end of the room is of Caen stone, and over this hangs a large painting. The lighting fixtures of the board room, consisting of brackets, candelabra, mantle shelf and table lamps with silk shades, were specially designed and made of carved English oak of a slightly darker tone than the wood work of the room, with the highlights furnished in gold leaf, thus affording a pleasing contrast with the enriching tones of gold enhancing their beauty. The furniture is English oak, and the whole room with its hangings and lighting has an air of refinement and beauty. It is a masterpiece of its kind.

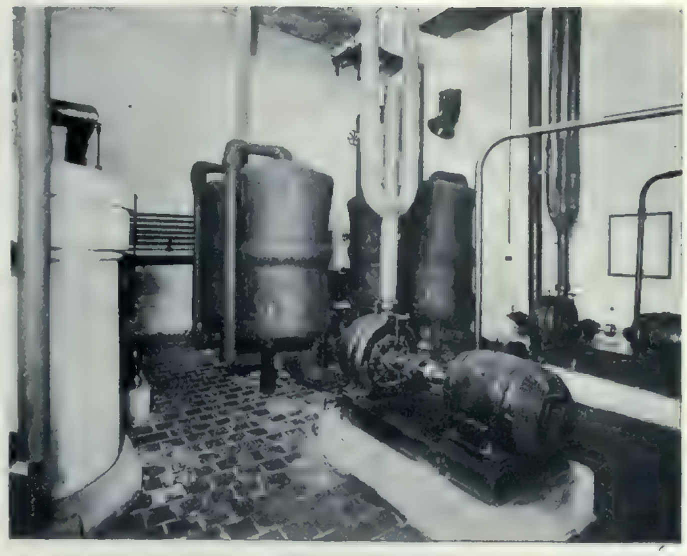
Clinton & Russell, of 32 Liberty street, New York, were the architects, and James L. Havill, of Toronto, was their representative on the work. All plans and specifications were made in the Toronto office of the architects.

Area of land, 8,730 sq. ft.; floor space, 70,156 sq. ft; cubical contents, 1,029,209 cubic feet; number of stories, 8 and basement and mezzanine; number of elevators, 3; tons of steel, 770; foundations started, Dec. 9th, 1915; column bases started, Feb. 17th, 1916; steel to grade, March 2nd, 1916; steel topped out, April 15th, 1916; masonry above grade, March 21st, 1916; building enclosed, May 29th, 1916; building completed, July 23rd, 1916.

The Engineer and The Architect

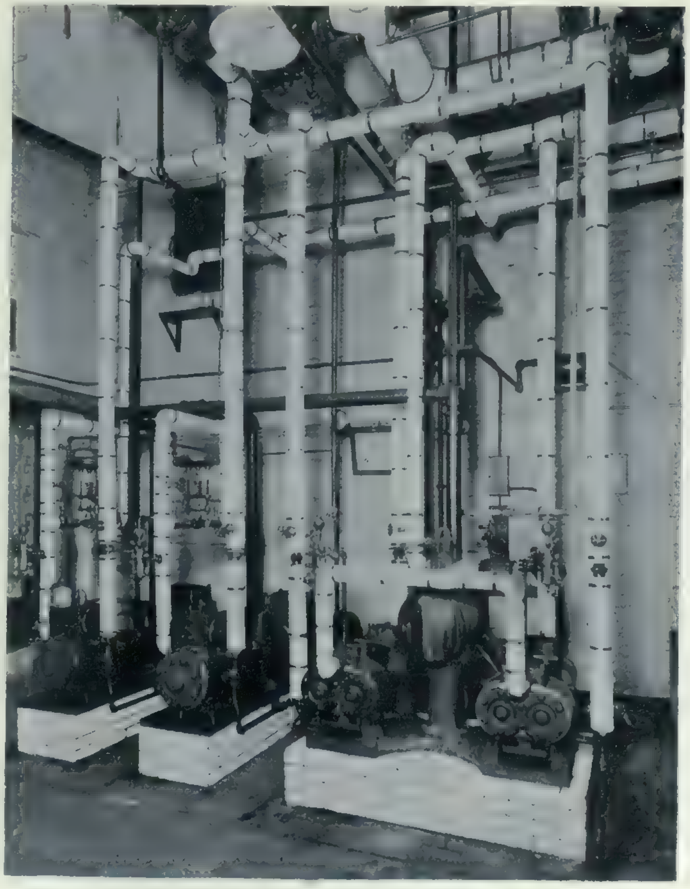
We have often heard the respective positions of the architect and engineer discussed, but have never read a terser or more apposite analysis of their relation to one another than that contained in an article in a recent number of the *Brickbuilder,* a great part of which we quote:—

"The architect is always an engineer, but the engineer, even though he has charge of the construction of a building, is seldom an architect. The greater always includes the lesser. Both the engineer and the architect have had their share of the world's work. The great spectacular achievements, such as railroads and canals, have fallen to the engineer, and his practice has crystallized into an exact science. Architecture, on the other hand, always has been an art. That is what makes architecture more than engineering, and keeps it perennially alert and ready for changes—a condition which rarely exists in the engineering profession. It is but fair, also, to admit that because of the readiness with which the architectural profession welcomes new ideas, because of its constantly changing point of view, it is apt to lag behind in attention to the exact sciences and the so-called practical work. This has been strikingly manifested during the past generation. The architectural profession was offered the enormous possibility of steel construction. The æsthetic side of it was immediately appreciated and developed to an extent which has produced results of which we may well be proud; but the so-called engineering features were in a measure ignored, not because architects could not master them, but because the really architectural solution had first to be sought. The engineers speedily usurped one side of the architectural problem, and our earlier steel-frame buildings were designed wholly by engineers with the result, unfortunately, that sometimes the construction was made more of than the architecture, and efficiency of the hidden was substituted for complete efficiency of the whole. During the last few years the conditions have been changing, and to-day it is fair to say that in most of the properly organized architectural offices the mechanical and so-called engineering problems in building construction are handled by the architect, and handled in a better, a more consistent, a more economical, and a more logical manner than the same problems were handled by the engineers in the earlier years. This is not saying that all architects are qualified to do their work. A profession is not judged by even its average attainment, but by its best work; and applying this measure to architecture it is fair to say that architects have outgrown any necessity of depending upon the engineers for construction.



VIEW OF WATER FILTERS.

"Structural engineering, as a profession, has not been very profitable of late years, and this fact has awakened many engineers to the possibilities of combining architecture with their own work. Since, unfortunately, the only requirement to be an architect is the ability to pay for a sign on the door, anyone who can get a job can call himself an architect, and we have in many of our cities engineers who simply hire draughtsmen, trust to their artistic luck, and get by with a good deal of building. In a few cases such engineers have developed real architectural talent, which the profession has been glad to recognize; but in more cases the result has



VIEW OF PUMPS IN POWER ROOM.

VIEW OF CUSTOMERS' ROOM.

meant a distinct lowering of architectural standards, and it is to be regretted that men who could be good engineers should choose to be poor architects for the sake of a little increased earning capacity. Most property owners would very naturally and very rightly prefer a good engineer to a poor architect, and as so many people fail to appreciate that architecture is not merely construction, heating, and ventilating, plumbing and electric equipment, but is fundamentally an orderly, logical and artistic solution of a practical problem, it is not to be wondered at that the engineer-architect has thriven of late years; but this does not mean a limitation of architecture. Anything that makes for better building of any kind, practically or artistically, is welcomed by any right-minded architect; and if an engineer can do better work than an architect, it is up to the architect to mend his ways.

VIEW OF ROOF SHOWING TILE ROOF AND PENT HOUSE.

VIEW OF GENERAL OFFICE.

"The architect has learned his constructive lessons, and the relation now between the professions is that the engineers are learning to follow the architect's footsteps and striving to clothe engineering with a thin veneer of architecture. That, as far as it goes, is good. Anything which relieves the crass materialism and crude efficiency of an engineering structure is a benefit to the community, and we would hope that the relation between the two professions may continue to be one in which the architect will point the way to better, more orderly, and more logical building, without any sacrifice of the innate architectural properties, and the engineer will be more willing to appreciate that real efficiency does not stop with a well-constructed skeleton."

VIEW OF A LAVATORY.

The above paragraphs contain the kernel of the matter, and while artists like Mr. Pennell may state that engineering is achitecture, we hold with the writer we have quoted that architecture includes engineering as the greater includes the less, and engineering can never displace architecture from the position she holds as the greatest of the arts, though engineering science may, and ought to, give greater scope to architectural skill.

The Bank of Toronto New Building, Montreal

A Substantial and Pleasing Example of a Bank Office Building.

THE new Bank of Toronto building, corner St. James and McGill Streets, Montreal, replaces the former building, which the bank had outgrown. It occupies a larger site, made possible by acquiring the neighboring property.

The main ideas in carrying out this building were to get the maximum amount of floor space for the banking room, and to carry out the whole in a substantial and pleasing manner without going in at all for elaborate and expensive ornamentation.

The building covers the whole of the property, with a frontage of ninety feet on St. James Street and sixty-two feet on McGill Street, and rises to ten storeys, the full height allowed by the Montreal building by-laws.

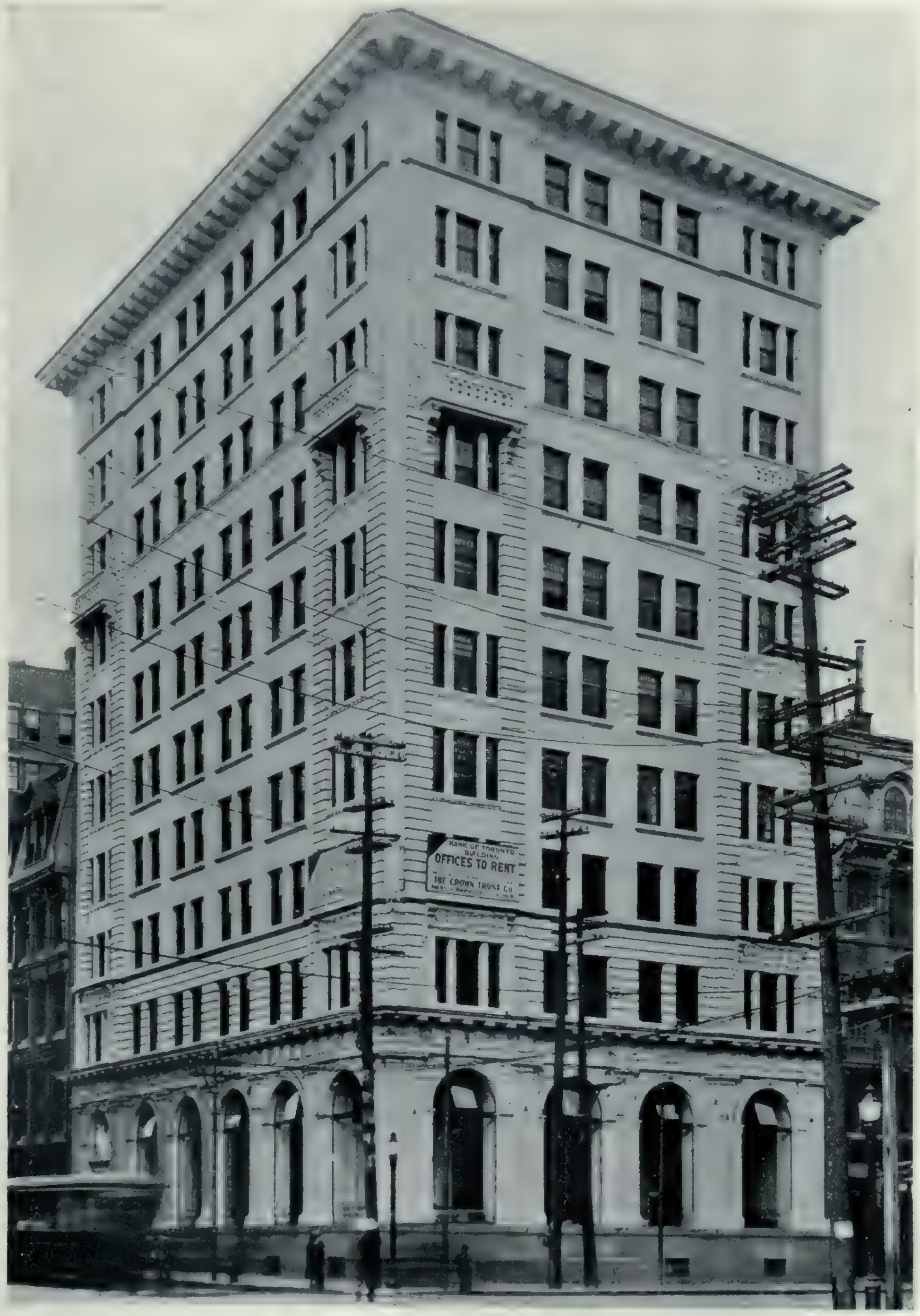
The base course is of plain polished granite to the line of the banking room window sills. From this line, up to the top of the cornice, is carried out in white glazed terra cotta.

The first storey shows a complete Doric order with large circular headed windows, this fairly elaborate detail marking the banking room.

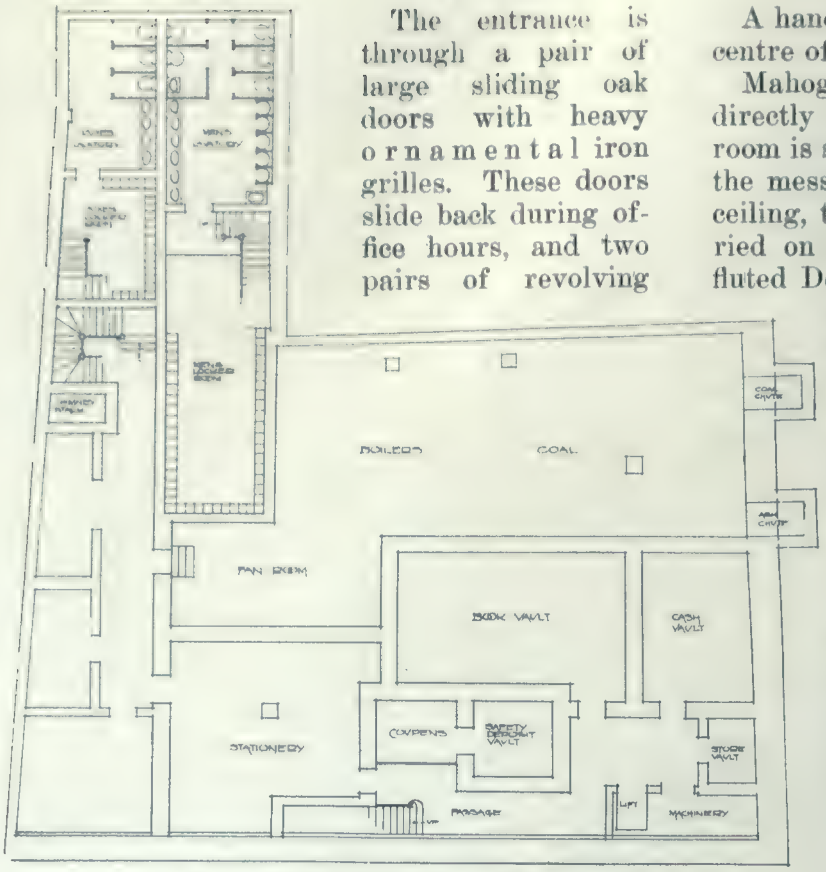
Above the ground floor the walls are carried up in plain block courses with a small amount of ornamentation on the first floor windows and small projecting balconies on the seventh floor. The top floor has flat ornamentation between the windows, and the whole is crowned by an elaborate Corinthian cornice. This treatment gives a dignified and substantial building without any appearance of elaboration.

The two party walls are faced with buff brick above the adjoining buildings with the name "Bank of Toronto" in large five foot letters in green glazed brick, which although visible for a long distance, is not too striking.

There is only one entrance to the building, next the party wall on the St. James Street front; by this arrangement the whole ground floor, except the entrance hall, elevator hall and stairs, is devoted to the banking room.



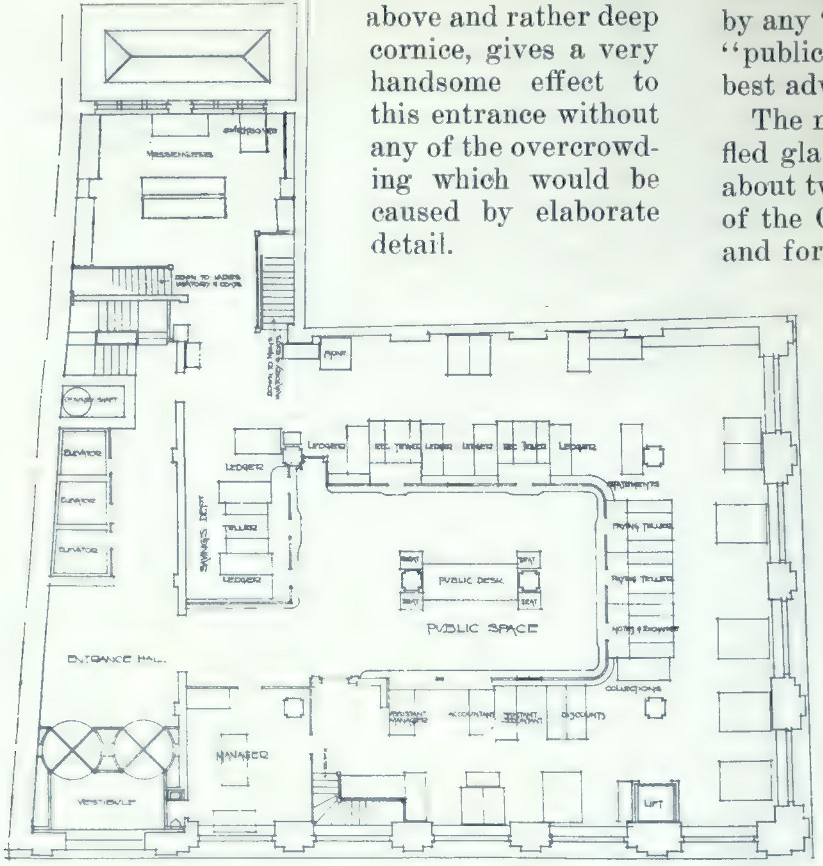
BANK OF TORONTO BUILDING, MONTREAL. HOGLE & DAVIS, ARCHITECTS.



BASEMENT PLAN, BANK OF TORONTO, MONTREAL.

The entrance is through a pair of large sliding oak doors with heavy ornamental iron grilles. These doors slide back during office hours, and two pairs of revolving doors lead directly into the main entrance hall.

This entrance hall and the elevator hall beyond are lined with grey Sienna marble to the height of about nine feet. This marble, which is "booked" in panels, together with the simple plaster panelling above and rather deep cornice, gives a very handsome effect to this entrance without any of the overcrowding which would be caused by elaborate detail.



GROUND FLOOR PLAN, BANK OF TORONTO, MONTREAL. HOGLE & DAVIS, ARCHITECTS.

A handsome cast bronze lantern hangs in the centre of this entrance hall.

Mahogany doors with bronze grilles open directly into the banking room. This banking room is sixty-seven feet by fifty-eight feet, with the messengers' department at the rear. The ceiling, twenty-two feet above the floor, is carried on six large piers, each formed of four fluted Doric pilasters. These piers are so arranged that they interfere in no way with either the "public" or the layout of the counter.

The counter is formed of tavernelle marble and a dado of similar design and marble is carried around the walls of the banking room and forming covers to the radiators in the windows.

The windows are exceptionally large, and no artificial light is necessary in the banking room, except in one or two places, as long as daylight lasts. The walls above the marble panels are finished with hard plaster in simple panels, and the ceiling is beamed in square panels with a simple cornice.

The whole color of the banking room is finished in deep creams and buffs to correspond with the tavernelle marble.

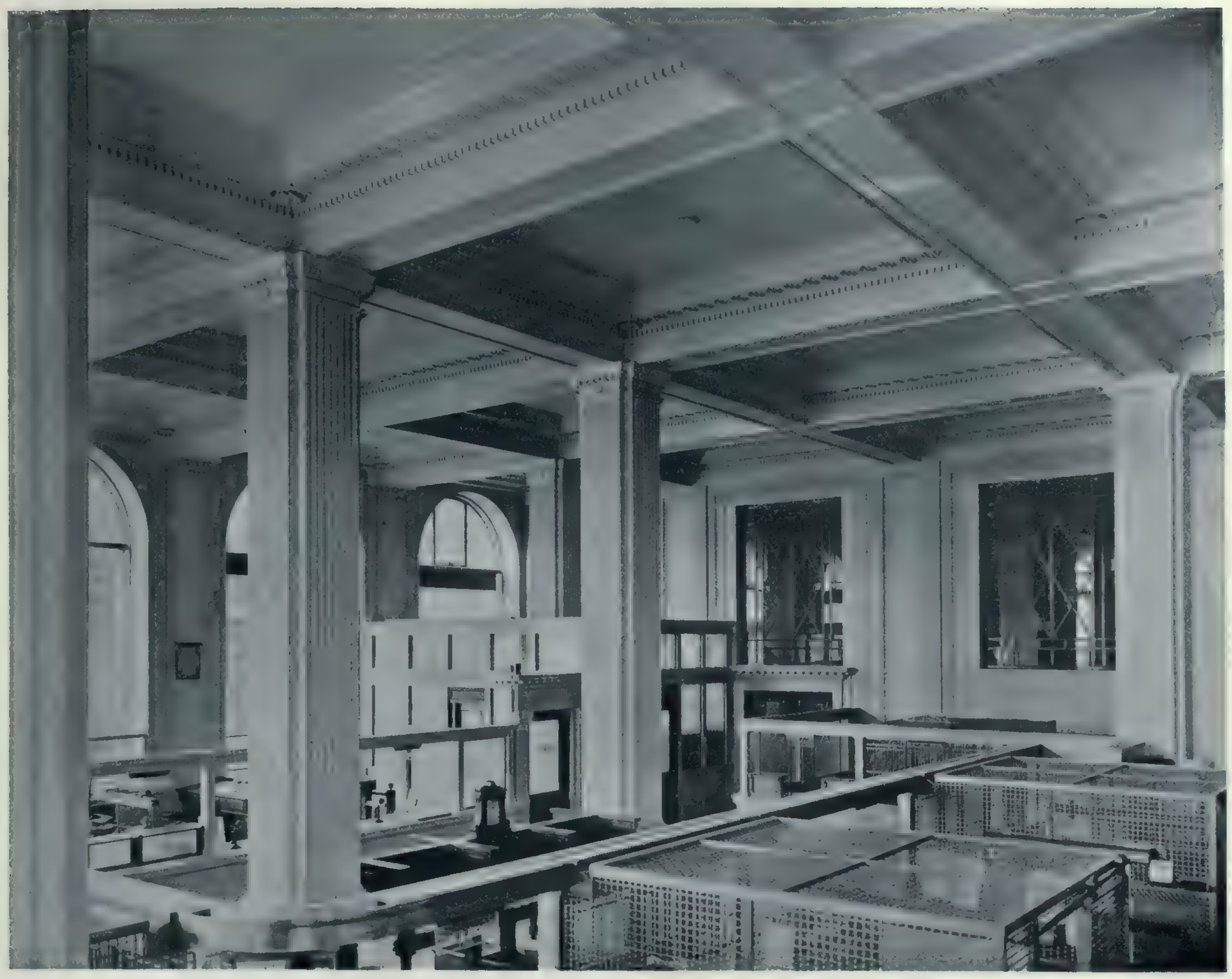
The manager's room is on the right of the entrance, and beyond the ante-room and counter form one continuous line around three sides of the "public" space to the entrance doors. By this arrangement no part of the staff is cut off by any "public" space from the others, and the "public" space being a rectangle, shows to the best advantage.

The manager's screen is in marble with muffled glass panels, and is carried to a height of about twelve feet. A handsome marble doorway of the Corinthian order leads to the ante-room and forms the main entrance to the manager's room.

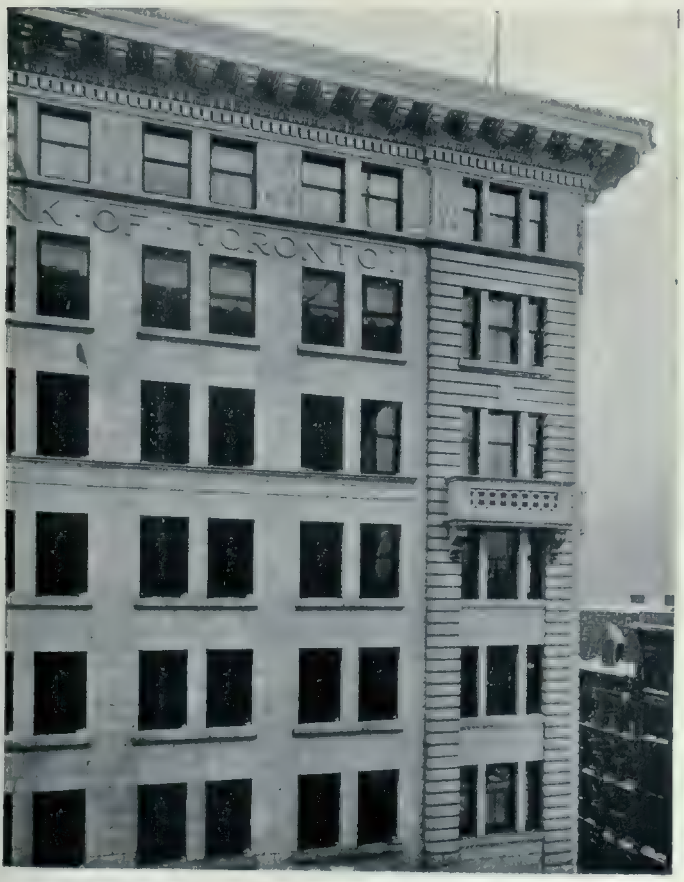
The counter screen is formed of tavernelle marble colonettes with simple entablature. The tellers' cages have simple bronze grilles with revolving wickets, the balance of the counter being open with glass shelves on bronze supports at the "ledgers."

There are no electroliers in the banking room, as the whole is done by a special system on top of the manager's screen and counter. This arrangement does away with the necessity of large fixtures cutting the view of the banking room and gives an even reflected light over the whole ceiling.

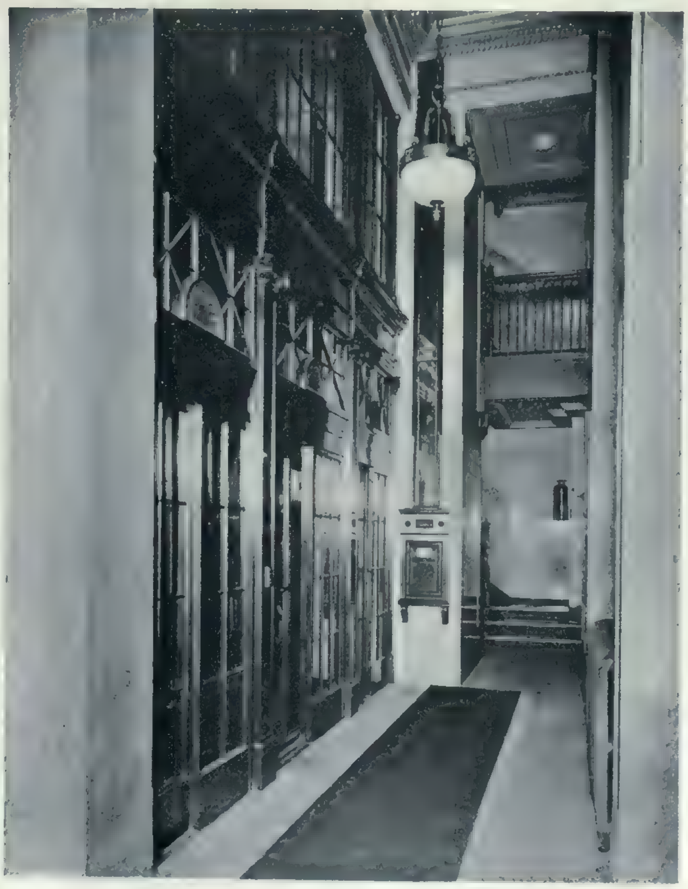
In order to afford the greatest amount of room to the bank proper, all the vaults, lavatories, coat rooms,



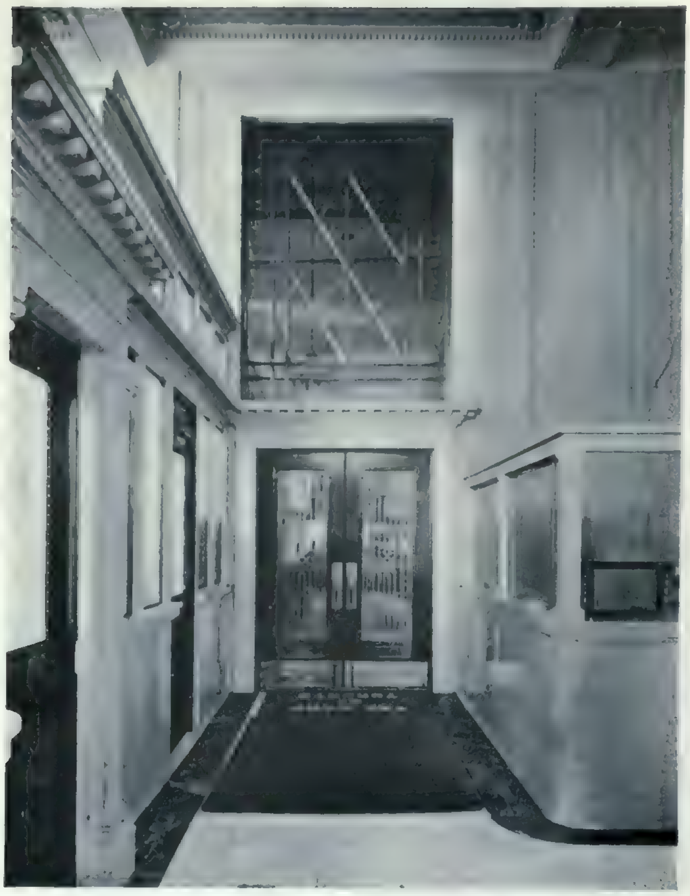
VIEW OF BANKING ROOM, BANK OF TORONTO BUILDING, MONTREAL. HOGLE & DAVIS, ARCHITECTS.



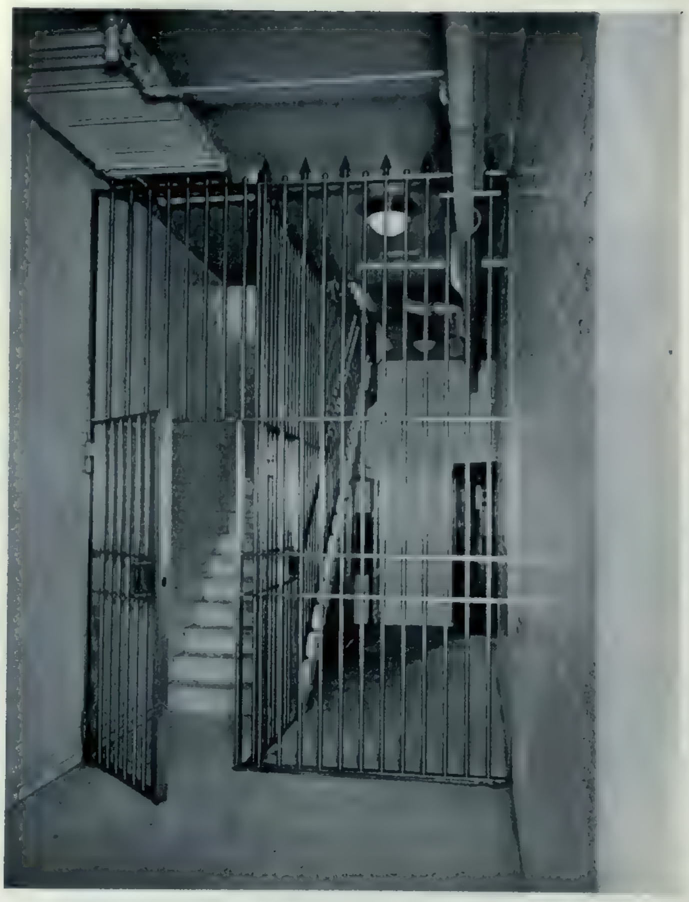
DETAIL VIEW OF CORNICE.



MAIN HALLWAY, SHOWING ELEVATOR FRONTS.

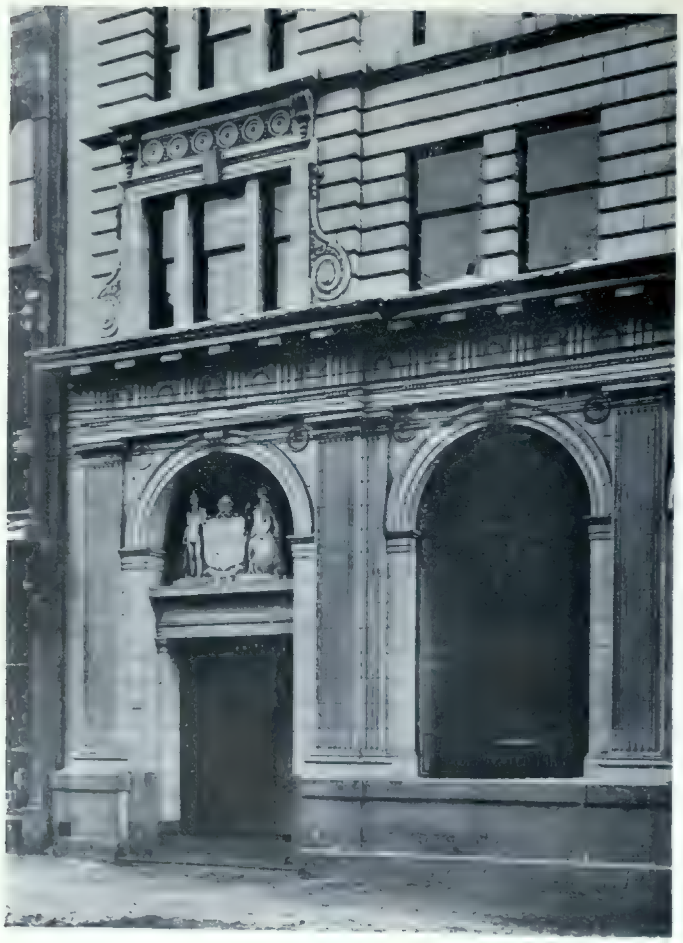


INSIDE VIEW OF ENTRANCE TO BANKING ROOM.

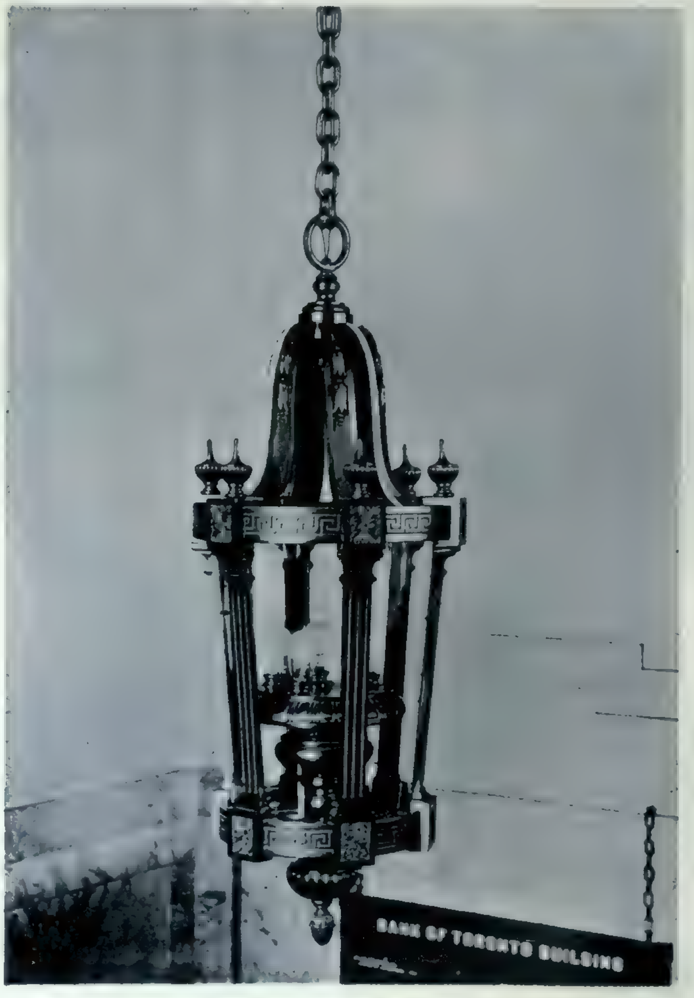


STEEL GRILLE WORK AROUND ENTRANCE TO SAFETY DEPOSIT VAULTS.

HOGLE & DAVIS, ARCHITECTS.



DETAIL VIEW OF MAIN ENTRANCE.



LANTERN IN HALLWAY.

were placed in the basement immediately below the banking room. A marble stair enclosed in a steel grille leads down from beside the manager's room to the safety deposits, and an electric lift takes the books from the between the safety deposit vault and also serves the adjacent money vault.

There are means of communication between the safety deposit valut and these last two through large steel grilles. The cash and safety deposit vaults are lined throughout in three layers of steel, and are fitted with the most modern type of vault doors. The outer doors are five inches thick, made up of five layers of steel. The inner doors are of three layers. These vaults are protected with the most modern burglar alarm system.

The book vault is exceptionally large, with a balcony carried around three sides, giving an extra amount of space. A similar balcony is provided in the cash vault. There is a small storage vault which provides for silver chests, etc., that may be deposited at the bank. The safety deposit vault is provided with booths for cutting coupons, examining documents, etc.

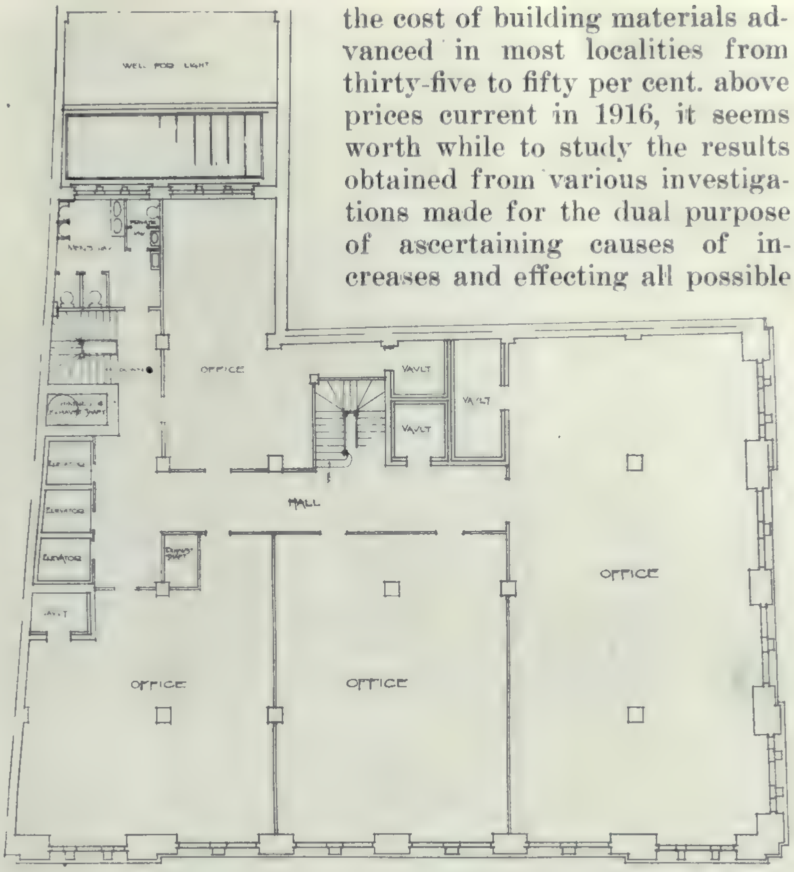
Coat rooms, lavatories, etc., for the men and women clerks are provided immediately beneath the banking room, and are reached by a separate stair. By this arrangement of vaults, coats, and lavatories, etc., while the whole of the ground floor is kept for banking purposes, the staff has no need to go to any other part of the building.

The floor in the banking room behind the counter is of cork tile, and in the "public," halls, etc., of white Italian marble with green border.

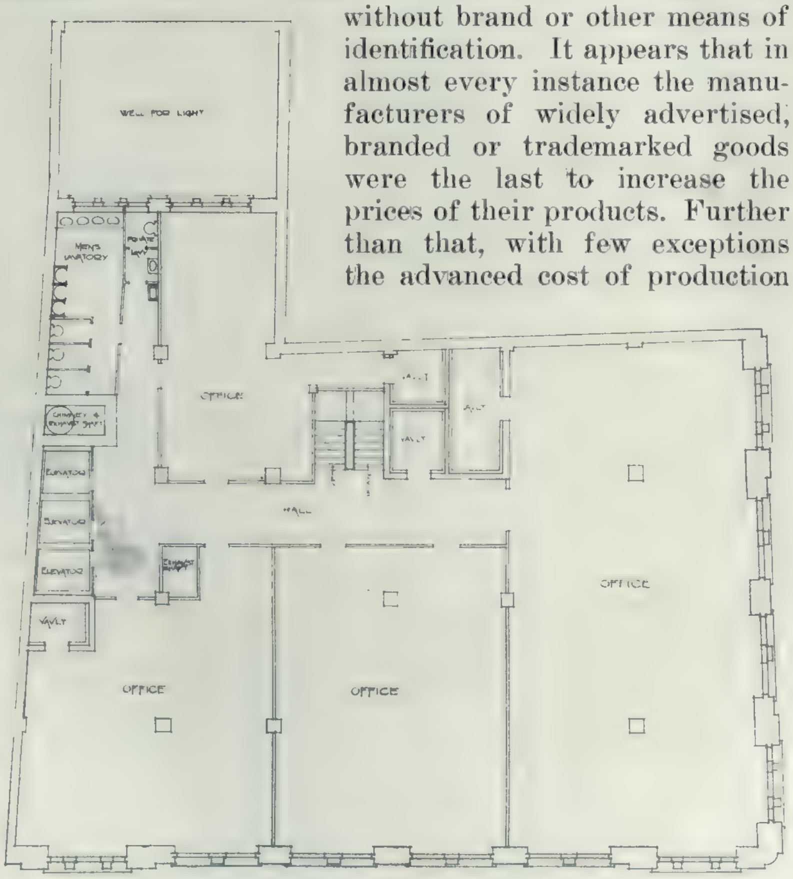
The upper floors are reached by three elevators with bronze cages and bronze and glass screens. The corridors are lined to a height of about four feet with Botticino marble, and have white Italian marble floors. The offices are divided to suit the tenant's requirements.

On the ninth floor there is a large lunch room, which will be used for the bank, well supplied with a large kitchen, larder, etc., and there is also an apartment for the bank's messenger.

The building is heated throughout by steam.



FIRST FLOOR PLAN, BANK OF TORONTO, MONTREAL.



SECOND TO EIGHTH FLOOR PLAN, BANK OF TORONTO, MONTREAL.

◆

Trademarked Materials

Under the present conditions with the cost of building materials advanced in most localities from thirty-five to fifty per cent. above prices current in 1916, it seems worth while to study the results obtained from various investigations made for the dual purpose of ascertaining causes of increases and effecting all possible economies. Of particular interest to both architects and owners engaged in such study are the reports of an inquiry recently conducted to determine the relative increases in cost of trademarked materials, compared with those sold without brand or other means of identification. It appears that in almost every instance the manufacturers of widely advertised, branded or trademarked goods were the last to increase the prices of their products. Further than that, with few exceptions the advanced cost of production

SHOWING DETAIL OF DOORWAY AND PARTITION AROUND MANAGER'S OFFICE IN MARBLE.

had been assumed in part by the manufacturers in the case of trademarked goods, whereas in others it was passed along to the consumer entirely, if in fact it was not increased.

The result of the inquiry might have been foretold, as it simply demonstrates again the responsibility which the manufacturer of a trademarked article feels, and which is not shared by the maker of a non-branded material. Not only must a manufacturer of the trademarked goods stand behind them, but he must avoid dissatisfaction, even with the price, to the limit of his ability, and a majority of them would rather assume a temporary loss of profits than to disturb relations with their customers by increasing prices. Where, as in the present instance, it is no longer possible to market their goods at the old price, it has been found that they have increased their prices as little as is consistent with the maintenance of the quality and continuation in business.

Viewed from any angle, it would seem that an architect is always protecting both his client's interests and his own reputation by selecting for use only those goods whose manufacturers are responsible, and who proclaim and make real that responsibility by marking their products so that they can be identified at all times, or at least until they have finally reached their respective places in the work for which they were intended.

SHOWING CUSTOMERS' DESK IN BANKING ROOM. HOGLE & DAVIS, ARCHITECTS.

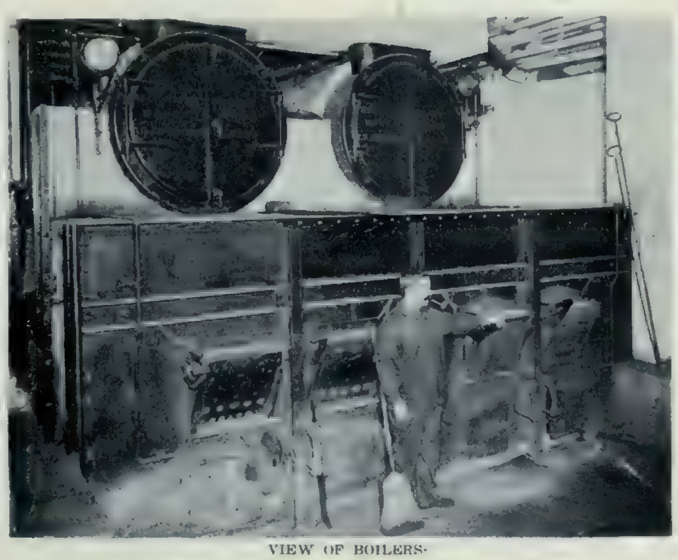
Governmental Endowment of a Chair of Architecture

An endowment of £2,000 a year has been granted by the New South Wales Government for a Chair of Architecture at Sydney University; and it is claimed that this is the first occasion of a Government of the British Empire recognizing the national importance of architecture. A certain twinge of envy must therefore accompany our nevertheless sincere congratulations to the Government and to the architects of New South Wales. But the example is not merely for Governments, but for those universities upon whom it has not yet dawned that architecture, broadly considered, has in it all the essentials of a liberal education. This news from New South Wales brings us much nearer to the time when any university from which a well-endowed Chair of Architecture is excluded will be regarded as being hopelessly behind the times. Particulars of the Sydney Chair are not yet available, and it will be interesting to learn whether the conditions provide for the complete absorption of the professor in scholastic work, or whether the authorities adopt the more modern view that he shall be at liberty to keep in touch with actual practice.—*Architect and Contract Reporter.*

Durability of Stucco and Plaster

Exhibitions have made the public familiar with stucco buildings, and the stucco villa enjoys a certain popularity in the suburban districts of many cities. That is so in America as well as in Europe, and the development has been so rapid that little opportunity has so far been found or been taken to observe and test the suitability of methods and materials, though the experience of stucco has not by any means always been satisfactory. In conjunction with the Associated Metal Lath Manufacturers the United States Bureau of Standards undertook, in 1911, exposure tests of metal laths plastered with various materials, mainly for the purpose of determining the best methods of construction to insure the protection of the metal from corrosion. These tests, which are still in progress, proved that painted or preferably galvanized lath, embedded in dense, water-resisting plastering material, would not corrode. At the same time, some plastering materials were in themselves found defective, of course, and the manufacturers of lime, cement, gypsum, hollow tiles, metal laths, etc., suggested a conference of interested parties. As a result a committee was appointed in 1914, consisting of members of the Bureau, of representatives of the Supervising Architect's Office of the Treasury, of the American Concrete Institute, of the industries, and, further, of three experienced contracting plasterers of good repute. A test structure, two hundred feet long, twenty-six feet wide and twenty-four feet high, was erected in the Bureau grounds, and fifty-six stucco panels, each about fifteen by ten feet, were prepared, the building serving for the exposure of the panels and for the erection of plaster walls and partitions. When the panels were examined, in April, 1916, after six months' exposure, only two panels were found entirely free of cracks; forty per cent. of the panels were considered satisfactory, but the majority were more or less deteriorated. The tests were rather discouraging; but it must be stated that in the panels a smooth type of finish, known as "sand float finish," had been employed, which is more likely than the rough type of finish adopted by builders to bring out defects.

VIEW OF INTERIOR OF VAULTS.


VIEW OF BOILERS.

VIEW OF SAFETY DEPOSIT VAULTS.

Engineers Plan National Industrial Preparedness

A Permanent Consulting Board Suggested, and a National Industrial Development Plan Outlined.

THE necessity for a proper plan of national industrial development, and the procedure to obtain the necessary information for the establishment of such a policy, led to the presentation of a memorandum along this line by five members of the Council of the Canadian Society of Civil Engineers. Sir Charles Ross, M.Am.-Soc.Mech.E., and head of the Ross Rifle Co.: Prof. C. H. McLeod, R. A. Ross, Walter J. Francis, and H. R. Safford. This was forwarded to the Government at Ottawa last April, but no action was taken upon it until a few weeks ago, when Sir Wilfrid Laurier asked that it be tabled in the House. The scheme outlined is worthy of serious consideration, and it is to be hoped that it will arouse a wide discussion on this subject throughout Canada.

"Acting on the suggestions of Sir Charles Ross and subsequent discussions, the undersigned engineers have the honor to transmit for your consideration a memorandum of their views regarding a National Industrial Development Plan for the Dominion. While we appreciate that this highly important matter has, no doubt, already received much careful consideration by the Government, nevertheless we sincerely trust that this memorandum may prove of service to you, and that you may find our suggestions acceptable. We submit them from a sense of patriotic duty and because we believe that Canada may well follow the example of the United States and other countries in calling upon engineers and scientists to render assistance, not only in these critical times, but in those which will succeed the war."

The accompanying memorandum was as follows:

The Necessity for a National Industrial Development Plan.—The history of any community or country is a record of the cycles of dynastic, economic or industrial change, the period of change in each instance being marked by a pause in the established order of progress.

The Dominion of Canada in common with the rest of the civilized world is at this time experiencing an interruption in its course of rapid development. Her position to-day may be likened to that of an industrial enterprise which has been financed and made ready to operate, and which has reached the time when dividends must be earned upon the expended capital before further capital is obtainable for increasing the equipment. In such a case prudent foresight dictates the taking of stock and the organizing of the enterprises along lines which will ensure co-operation among the different departments with a view to the largest possible production.

In this country the Government, through its various activities, has taken stock to some extent of our land, forest and mineral resources, and has in a degree also interested itself in investigations of the manufacture of certain products, such as steel and paper.

The curtailment of imports and the increasing demands, resulting from the present war, have compelled Canada to depend upon and to develop a number of her own resources. Zinc, for example, heretofore largely produced abroad, is now being smelted in this country, and magnesite, formerly imported, is now being mined, utilized and exported in considerable quantities. Phosphates, recently discovered, may later be added to our productions.

It would therefore appear that if a concerted effort were made to determine our requirements for domestic and foreign trade and to investigate the results from an economic standpoint, the country as a whole and our industrial enterprises individually would be placed in a position to develop and increase their activities along logical lines within the limits of known resources.

A knowledge of the mere existence of raw materials is insufficient. It is essential that their character, best uses and final fabrication into marketable products should be studied. Teamwork by the business interests, led, directed and assisted by the Government, would appear to be the proper method of systematizing all our forces in order that the greatest good to the greatest number may result.

The beginning of a cycle of industrial production has arrived, and if Canada is to increase her industrial weight in the world or even maintain her relative importance and her normal rate of increase, it is imperative that concerted action be taken towards co-ordinating her efforts as other countries are doing.

The Results Desired Through a National Industrial Development Plan.—A community is an economic unit, and the mechanisms of that unit should be so co-ordinated as to produce the largest and most far-reaching results. A primitive community, fed, clothed and housed, having no further necessities is an agricultural State only. Rapid increase of population and urban concentration demand the creation and development of new mechanisms to provide food, clothing and habitations. Industrial enterprises must be created to support the population. Means of communication and transportation must also be established for the handling of either raw or manufactured products among the various groups and between the point of production and the transportation outlets of the country. There will, therefore, immediately spring up a demand for products other than bare necessities. As everything is derived from the earth, two questions arise, the first being whether or not the additional products can be obtained economically from the resources of the country, and the second whether or not these additional products may be economically turned into finished products within the country. The correct answers to these questions demand close study on the part of the most scientifically trained minds.

At the present time the industrial enterprises of the country are working individually, each towards its own end, without being mobilized for efficient production from a national standpoint. It is obvious that systematic co-operation of the various enterprises will result in benefit to the country as a whole.

We are of the opinion that information regarding the resources of the country and the results of the study of the economics of the industrial situation should be made and rendered available to the public. If this were done, present undertakings would benefit and many new enterprises would spring up with a reasonable prospect of success. The Government is the only organization which can properly co-ordinate, instruct and give direction to the activities of the country. If furnished with properly ascertained facts and with co-ordinated Government guidance, no industry, whether established or newly formed, can fail to benefit itself and the whole community.

To be more specific, we mention a number of points which will doubtless arise for consideration in the working out of a national development plan:

(*a*) The gathering of statistics of the products of the country as regards both quality and quantity, the conditions of production or growth, the cost of production and the cost of marketing.

(*b*) An investigation as to the possibility of the economic production of any article of commercial importance not now manufactured, mined or grown in Canada.

(*c*) The most profitable methods of manufacture or growth of present or future products, and the increase of output. This involves provision for research, trade schools, and the intimate personal training of the farming community by means of model farms and otherwise.

(*d*) Complete information regarding the most advantageous markets, a point which involves full study of the problems of transportation.

The results which should flow from this work are:

(1) More complete utilization of the national resources of the country,

(2) The general introduction of more scientific and commercially profitable methods of production,

(3) An increase in production by reason of the improved methods and widened fields of operation, and

(4) A reduction in cost to the consumer through the elimination of unnecessary handling and improvement in transportation.

A Suggested Method of Procedure to Obtain the Necessary Information for the Establishment of a Policy.—It is a well-established fact that the material development of modern civilization is in the hands of the engineer and the chemist.

The necessity for a national industrial development plan and the results desired therefrom have been fully recognized by other nations. It is needless at the present time to refer to the fact that Germany recognized the need very early, and had long since begun to reap the results the German Government desired. The economic and military preparedness of Germany has indicated to the rest of the world not only the advisability but the absolute necessity of scientific handling of the economic resources and forces of the community.

Spurred on by recent events, Great Britain, France and the United States of America have

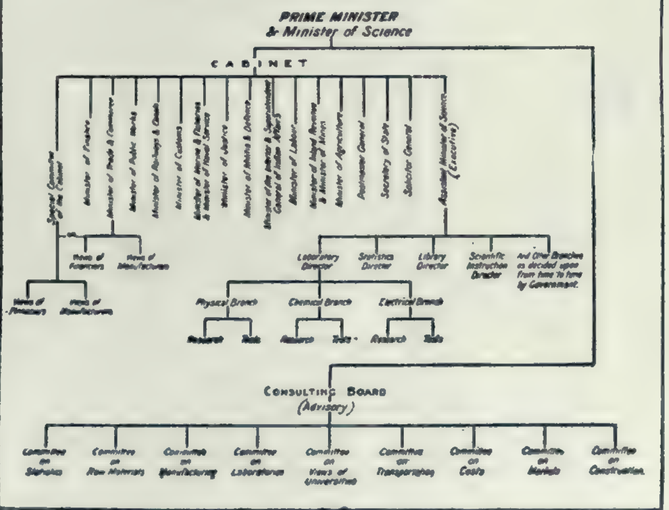
· PREPAREDNESS ·

CHART OF PROPOSED ORGANIZATION FOR CANADA

SHOWING

The Relations of the Consulting Board to the Prime Minister
the Cabinet and the Departments of the Government
and
The Methods of obtaining the Essential Facts and the Views of the People
without Duplication of Effort

The Chart assumes that the Government has decided to institute a Department of Science in co-operation with a Consulting Board, and wishes to establish a National Laboratory
The Consulting Board has then to advise the Government on two points,—
A - The Essential Facts
B - The Methods of Determination of the Essential Facts
The Chart shows how the Consulting Board obtains the Complete Information
The Chart also assumes that the Government desires the Views of Manufacturers and Financiers, and it therefore indicates the Method whereby this may be accomplished either by the Department of Trade and Commerce or by a Special Committee of the Cabinet


PRIME MINISTER
& Minister of Science
CABINET
Special Committee of the Cabinet
Minister of Finance
Minister of Trade & Commerce
Minister of Public Works
Minister of Railways & Canals
Minister of Customs
Minister of Marine & Fisheries & Minister of Naval Service
Minister of Justice
Minister of Militia & Defence
Minister of the Interior & Superintendent General of Indian Affairs
Minister of Labour
Minister of Inland Revenue & Minister of Mines
Minister of Agriculture
Postmaster General
Secretary of State
Solicitor General
Assistant Minister of Science (Executive)
Views of Financiers
Views of Manufacturers
Views of Financiers
Views of Manufacturers
Laboratory Director
Statistics Director
Library Director
Scientific Instruction Director
And Other Branches as decided upon from time to time by Government.
Physical Branch
Chemical Branch
Electrical Branch
Research
Tests
Research
Tests
Research
Tests
CONSULTING BOARD
(Advisory)
Committee on Statistics
Committee on Raw Materials
Committee on Manufacturing
Committee on Laboratories
Committee on Views of Universities
Committee on Transportation
Committee on Costs
Committee on Markets
Committee on Construction.

each in its own way seriously taken up the subject—one of the most important of the present day. The war over, competition will be unprecedented. With Europe impoverished as a result of the struggle her immediate need will be employment for the industrial population in order not only to prevent starvation in the industrial ranks, but as far as possible to regain the lost wealth and to recover the lost trade.

Although affected favorably rather than otherwise by the present situation, the United States recognizes the above facts and realizes that future competition is something which may only be met by the most thorough preparation. The Americans have, therefore, taken up the question of national preparedness and have appointed what is known as the Naval Consulting Board, consisting of representatives nominated by the great engineering and scientific bodies of the United States, namely: American Society of Civil Engineers, American Institute of Electrical Engineers, the American Society of Mechanical Engineers, American Institute of Mining Engineers, American Chemical Society, American Electro-chemical Society, American Mathematical Society, American Aeronautical Society, the Investors' Guild, the American Society of Automobile Engineers, and American Society of Aeronautic Engineers.

Originally the Naval Consulting Board was intended to act in an advisory capacity with regard to naval affairs only, but its activities have since its organization been extended to include the investigation of the industrial resources of the country with a view to advising on a national policy therefor. It is interesting to note that practically the first recommendation made by this body was for the establishing of a national laboratory devoted to the solving of problems in chemistry, metallurgy, aeronautics, electricity and kindred subjects, and the placing of the information so obtained at the disposal of the community.

The recommendation for a national laboratory was made, notwithstanding the fact that the Bureau of Standards of the United States, already established about fifteen years and quite broad in its field of action, has been doing excellent work and rendering valuable service to all classes of the community. In making the recommendation the Naval Consulting Board doubtless had in mind the development of equipment especially suited to the requirements of the army and the navy on such a scale as would demonstrate results before attempting commercial manufacture. By this course all new developments in guns, aeroplane engines and the like may be thoroughly tried out before the placing of large contracts by the Government.

The organization of the Naval Consulting Board has placed the scientific and technical talent of the country at the disposal of the United States without cost for professional service.

The French Republic has organized a civilian board similar to the United States Naval Consulting Board and has raised it to the dignity of a ministry (Le Ministere des Inventions). Great Britain has also enlisted the services of a board of civilian scientists and technologists with a view to the utmost development of the nation's industries for the prosecution of the war.

In view of the action of the United States, France and Great Britain, we are not suggesting a new or untried principle. This is further confirmed by the bibliography attached hereto. If engineering may be turned to the advantage of the country, we conceive it to be our duty to respectfully suggest that an invitation to cooperate be extended to the engineering and scientific societies in order that they may be in a position to render an official service to the Dominion.

The Government of the United States in appointing the Naval Consulting Board, selected engineers who have wide knowledge of engineering economics, thereby admitting that many of the problems of the industrial community are both scientific and economic in their nature. It was recognized also that the Government of the United States itself could not meet a situation of this kind through its own bureaux, since they are lacking in that contact with commercial conditions which is the essence of the case. Further, no mobilization of industrial organizations could be expected from the interested business enterprises acting apart from the Government. In other words, it was recognized that between the Government and industry there was required a body commanding the respect of both and recognized as authoritative by reason not only of its scientific attainments, but also by reason of its disinterestedness. Under these conditions the Government of the United States naturally turned to the engineering and scientific societies as being the only group from which could be expected the necessary technical and economic knowledge coupled with freedom from the rivalries of the commercial world.

We are, therefore encouraged to express the opinion that the Canadian Government cannot do better than address the engineering and scientific societies of Canada, inviting them to appoint from their number representatives whose advice would be at all times available to the Government. We feel sure that the engineers and scientists in Canada have as much public spirit as their professional brethren in the United States, and that a properly authorized consulting board of engineers would draw to itself the best talent in the country, and that without remuneration.

Following this idea, we venture to express the view that the necessities of the immediate present at least might be met by selecting representatives of the civil, mechanical, electrical, mining and chemical engineers.

There is in Canada one engineering organization, namely, the Canadian Society of Civil Engineers, which embraces all branches of engineering and may be taken to correspond largely to the five great scientific bodies from which the Government of the United States selected the great part of its Naval Consulting Board. There are in addition two other organizations of less magnitude, and which include in their membership a number who are also members of the Canadian Society of Civil Engineers. These two are the Canadian Mining Institute and the Society of Chemical Industry. The Royal Society of Canada may also be considered a scientific society, but the great majority of its members are devoted to philosophy and literature. The accompanying chart indicates the number of fully qualified technical men in each of the organizations named.

In order that our view may be either confirmed or modified, we beg to suggest that the Government call prominent members of the industrial, engineering and scientific communities into its counsel and question them as to the necessities of the case and the best methods of procedure.

The Formation of a Permanent Consulting Board.—Assuming that the results of the investigation made along the suggested lines have been favorably considered by the Government and found acceptable in a broad way to all parties, it becomes pertinent to indicate the possible organization and power of such a body.

The introduction of a Consulting Board into the mechanism of government should not result in any upsetting or changing of the present Government organizations. On the contrary, the Consulting Board should be supplementary to and independent of the executive and be free to act either in the interest of any individual department of the Government or in the interest of the Government as regards its general policy in relation to industrial development.

Possibly the Government may later consider it advisable to establish a "Ministry of Industrial Development" or a "Ministry of Science," but if so, this does not in any way affect the principle of the present suggestion. We have attached hereto a diagram indicating our ideas of the function of the permanent Consulting Board and its relation to the Prime Minister.

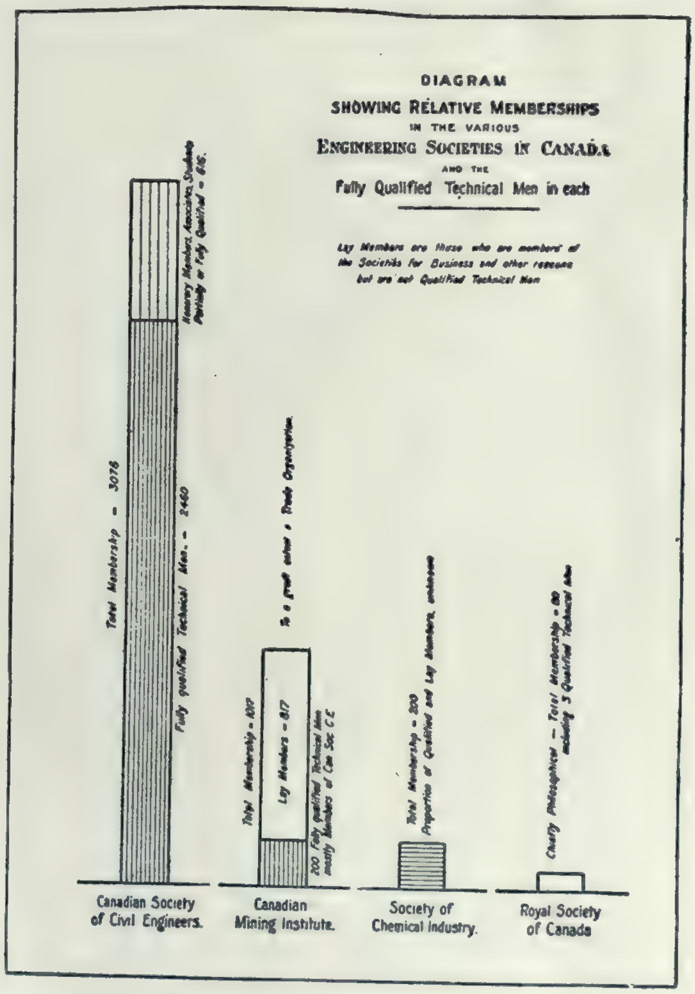
We trust we may be pardoned for suggesting that the personnel of the Permanent Consulting Board should be free from political, individual or trade bias. The members should be in a position to deal with the technical matters presented to it in the same disinterested spirit as that with which the Bench acts, and in the suggestion referred to above this feature has been carefully kept in mind.

Assuming, then, the concurrence of the engineering and the scientific bodies above referred to, we would suggest that the Consulting Board be composed of two representatives in civil engineering, two representatives in mechanical and electrical engineering, two representatives in mining and metallurgical engineering, and two representatives in chemical engineering, all nominated by their respective societies to act each during the pleasure of the Government or of the nominating bodies. Further, we would suggest that the recall of any member be at the option of either the Government or the society, replacement, however, to be always at the discretion of the society.

The official headquarters would presumably be at Ottawa in an office provided by the Government, together with a well-paid and highly competent engineering secretary.

The operations of the board will require a certain amount of detail work, usually performed by subordinates. We believe that the Consulting Board should be authorized to appoint the necessary subordinates to carry out details.

If it be found desirable to make a census or investigation of the industries of the country the board might call upon non-paid technical assistants from the branches of the societies in the different Provinces, following the course pur-



sued by the Naval Consulting Board of the United States in investigating the industrial resources of each State.

Function of the Consulting Board.—The function of the Consulting Board is outlined in the diagram already referred to. Briefly, it should act as consulting engineers to the Dominion Government represented by the Prime Minister, independent of any department of the Government yet available through the Prime Minister to all, in precisely the same way that the general manager of a large corporation has consulting engineers at his call, not on his staff, but available to take up, independently of the working organization, all such technical or economic problems as he may desire to have solved.

The Creation and Maintenance of a Department of Investigation, Research or Reference. If the Consulting Board be constituted along the lines we have suggested it will probably recommend that the Government establish a national testing and investigating laboratory for technical tests, investigation, research, reference or experiment. Such a laboratory would do for the Government precisely what any laboratory department does for a large manufacturing company, namely, investigate the materials, supplies, the processes employed in producing finished products and the economics of the production as related to technical matters.

The Management of an Architect's Office

Some Reflections of a Draughtsman of Experience in a Large New York Office.

WE give copious extracts from an article which recently appeared in the *Brickbuilder,* since many of the reflections would apply equally here, and the article is written in a clear and effective style, and shows signs of a humorous appreciation of some of the difficulties of an architectural practice:—

On the fourth floor of a rather old-fashioned building in the city of New York is a suite of offices, the entrance door to which bears on its plate-glass panel the name of one of the best-known architects in the country. Inside is the usual arrangement of rooms—a public office where sit four or five stenographers, a finely equipped library, a private office haphazardly decorated with sketches, renderings, photographs and models, fragments of ornaments, casts, books and magazines, bronzes and marbles, Persian rugs and ancient altar cloths and the thousand and one bits of detail that an architect picks up in the course of a long career. There is a file room where are hung the drawings of several hundred buildings, and finally the big drafting room which at times accommodates a score or more of men.

Here I have spent five years in service, five years in working over all the problems that come the way of a general draughtsman in a fair-sized office. . . .

I have seen the things that have made the office famous, and I have seen the things that have retarded its progress, hampered its success, and, from a purely business standpoint, lessened the profits. . . .

It is difficult to discuss men without using names; therefore, for the sake of convenience, we will call the architect himself Smith, and his three lieutenants Black, White and Gray. Mr. Smith—we sometimes call him the Governor—rarely used a drawing pencil except in the making of thumbnail sketches now and then, at which he was an amazingly rapid worker. His work was largely confined to the entertaining—the word is used advisedly—of clients, and parleying with contractors when the problem seemed too difficult for his subordinates to handle. Mr. Black might have been termed financial manager and general overseer of outside work; White was the designer, a Beaux Arts man, interested solely in the artistic side of his profession. Gray was head draughtsman.

In the early days of my service I wondered at the amount of work that came into the office and the apparent ease with which it was secured, and I soon attributed it in a large degree to the personality of the Governor. He was a thorough diplomat. An excellent conversationalist, educated, well read, he had that rare ability to talk intelligently and entertainingly with any man. I have frequently heard him say that to be successful an architect must be well versed in all branches of the fine arts; that a man who cannot appreciate good music cannot fully appreciate good architecture. He made friends easily, and frequented clubs and societies where desirable acquaintances might be cultivated. . . .

In the matter of getting out preliminary sketches he used a discretion that is sometimes lacking. For the real estate promoter who looked at all things from a cold business standpoint, plain business-like sketches were furnished, sometimes no more than rough plans colored in with a red pencil; but if the client seemed likely to be attracted by highly decorative drawings, White was permitted to amuse himself for a day or two with water colors and gold tape.

Withal there were many things that a draughtsman might have learned to his profit, but there were flaws, costly flaws, in the running of the office, and it is with them that I shall henceforth concern myself. Perhaps it is safe to say that we learn more from the errors that we note than from the successes that we observe without comment. . . .

The greatest fault may be described as lack of team-work among the powers that governed. A dozen times I have heard a new draughtsman exclaim, "Who is the head of this drafting room?"

A man would be assigned to a new job. White would give him a few instructions, and he would prepare his drawings under the occasional supervision of Gray. Then, when his work was well along, Black would look at it and straightway announce, "That's not the idea at all." Gray would be summoned, and forgetting the fact that it had been his job to keep his eye on the draughtsman, would join Black in criticism. The draughtsman, nettled, would start again on a clean sheet, or, "to save time," would spend half a day in erasing his innocent errors. Then, when he had finally satisfied the two lieutenants, Mr. Smith himself would saunter in, study the drawing, and remark, "That's very pretty, but it's not right." . . .

How different from another office in which the head draughtsman, now a member of the firm, made it his practice to devote an hour each day, outside of office hours, if necessary, in studying the requirements of the problems in hand, and then, the first thing in the morning, assuring himself that every draughtsman understood exactly what his day's work was to be. . . .

The second flaw in our office management is illustrated by an incident which occurred when a number of new men were hired at a particularly busy time. We were hard at work just then on a large bank building. At the same time we were preparing sketches for a Gothic church. Now it happened that several of us had had considerable experience in church designing, while one of the new men had come to us from an office noted for its banks. The logical thing would have been to put the new man into the bank work and to permit one of us to make the sketches, which we could have done in a few days. What did happen was just the reverse. The new man was assigned to the church, and finding himself up against an unfamiliar problem, was obliged to take two or three times as long as one of the rest of us would have required, besides calling us in occasionally to help him. . . .

It was not long after this that it became necessary to rush through a set of drawings—"every drawing done by May 1." When a week or more had gone by it became evident that the force of men then employed could not do the task in the allotted time. It could have been done if each man had put in two or three evenings a week, but we were not supposed to put in overtime except by request, and we were not then requested. The firm decided to hire new men. Obviously a new draughtsman, unfamiliar with his problem, will accomplish less in a given time than one who has worked on the drawings from the start. On May 1 the work was not completed, and it was decided to ask the men to work nights. Here again the policy of the office interfered with its work. Almost any draughtsman is willing to do extra work occasionally, but when he is required to work nights he has a right to expect pay for it; if not "time-and-a-half," at least at his regular rate. In our office, however, we were seldom paid directly for overtime. Instead, we kept an account of our time, and later, when the rush was over, we were allowed a vacation equivalent to the time we had worked. Fair enough sometimes, but there are times when a man needs money more than he does the vacation. . . .

. . . Mr. Smith's men might have been divided into two general classes—the older men, men of eight or ten years' experience or more, and the younger fellows, boys of eighteen or twenty, still in their student days. That these younger draughtsmen should be given every opportunity to develop their talents was perfectly fair, and the more experienced men were always ready to help them with advice and criticism; but sometimes we thought that the thing was being carried to extremes. The crisis came when one of the best men we had gave notice that he intended to leave. The Governor asked the reason for his sudden departure, and the reply was, "I have spent fifteen years learning to be a designer and I'll be hanged before I'll waste my time tracing foundation plans while the office boy does the designing." It may sound like a case of injured pride, but we all felt that the man was justified; even the office boy designer agreed with us. He had been given a task beyond his ability, and he knew it. It was simply an example of the tactless method we had of assigning work, and it resulted in the loss of a valuable man.

Every office suffers from the failure of some of its draughtsmen to appreciate the true value of their work. There is always the draughtsman who omits structural details whenever possible, on the supposition that the builder will know better than he does how to build them. Then there is the fellow whose ambition to produce a beautiful drawing so absorbs his attention that he loses sight of the fact that he is doing a detail for the sole use of a few workmen, and not for exhibition purposes.

I recently saw a drawing made by just this sort of draughtsman. It was a ¾-in. scale detail of an entrance to a public building. The man had actually drawn more than 8,000 individual bricks! . . .

From my experience in trying to analyze the leakage of time and energy in Mr. Smith's office, I am inclined to believe that more time is wasted in the making of details than in any other way. The Governor frequently criticized us for our methods of making scale details. "Remember," he would warn us, "you are making that drawing for the metal worker; don't waste time showing wood, and plaster, and marble trim." We listened and obeyed, but we sometimes felt that his criticism was not well founded. One carefully drawn sheet showing all materials in their correct relations to each other would have been of more value to the contractor than half a dozen separate drawings, and would have saved much of our time. What we were making was really a series of shop drawings which the subcontractors, sooner or later, made over in their own way. It is not the student whose outside work enters into my criticism, it is the draughtsman who tries to build up a practice for himself while still an employee. In Smith's office we seldom accepted a job amounting to less than $15,000 or $20,000, unless the Governor felt obliged to do so for diplomatic reasons. Consequently, when one of the draughtsmen had a chance to do a small house or garage he didn't turn it over to the office, but made the drawings himself in his spare time—a practice that the office not only countenanced, but, to some extent, encouraged. The men benefited by it not only financially, but they were getting excellent experience.

The danger of the practice, however, lies in the abuse of it, and, in Mr. Smith's office, it must be confessed, certain of the men abused the privilege to a great extent. One man in particular had built up such a practice of his own that he was actually robbing the firm of work—schools, small theatres, and commercial buildings that ought to have been regular office jobs he captured under the very eyes of the Governor. . . .

I would not discourage the draughtsman who can add to his income as well as to his experience and knowledge of the practical things in architecture by an occasional bit of work of his own, but to the architect who encourages the practice in his employees I would respectfully suggest that he watch out for the sort of man I have described—his genius is not rare—and if he finds him, either take him into the firm in self-defence, or else part company with him.

I might go into numerous other topics—the way in which the head draughtsman and the specification writer worked in utter independence of each other, a state of affairs which resulted in numerous discrepancies in plans, necessitating erasures and corrections; the Governor's habit of demanding the drawings on a given date, and then ignoring them for a week or more, until we learned to discount his demands, so that when he really wanted a drawing on time he had difficulty in getting it; and White's custom of permitting a draughtsman to do sheet after sheet of ornamental detail as he pleased, and then blue pencilling the entire lot, changing mouldings in their entirety, until the draughtsman, in disgust, was prone to tear up his work and start anew. . . .

I have wondered sometimes to what extent these unfortunate conditions exist in other offices. Smith's is not the only office that is losing money by mismanagement. A well-known architect has said that the ideal office is that in which there are no draughtsmen. He may be right. But, granting that draughtsmen are sometimes necessary evils, the greatest possible efficiency can be attained only when the drafting-room is under the supervision of one capable head man, and, if I may add one more condition, when the architect himself is in sufficiently intimate touch with his office to know whether or not his ideas are being properly carried out; whether, in short, his lieutenants are efficient directors. . . .

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Forest Resources of Bulgaria

When Bulgaria was separated from Turkey, the dense forests that formerly covered the country had nearly disappeared, and no steps had ever been taken to conserve them. In December, 1878, soon after the establishment of the Principality of Bulgaria, one of the reforms instituted by the new Government was the issuance of conservation regulations and the appointment of overseers and keepers charged with the duty of protecting the forests. Other regulations followed, prohibiting the export of wood, declaring all forest lands taxable, and providing for reafforestation. Still later the sections to be felled were prescribed, monopolies and destructive exploitation were forbidden, and instructions published as to the best methods of preventing and combating forest fires. In the year 1908, the latest year for which statistics are available, the forest area of Bulgaria comprised 7,086,232 acres, of which 3,333,596 belonged to the various parishes, 1,611,423 to the State, 1,096,785 to private owners, and the remainder, 1,044,428 acres, to churches, monasteries, mosques, schools, the Bulgarian National Bank, and the Bulgarian Agricultural Bank. The forests then comprised about thirty per cent. of the total area of the country, were valued at $125,000,000, and it was claimed that Bulgaria had two and one-half acres of forest to every inhabitant. Bulgaria, therefore, was at that time richer in forests than Germany, Italy, Roumania, Switzerland, France, Spain, Portugal, or Greece, and vastly better off than Hungary, while it had but three per cent. less forests than Austria, Sweden, or Norway.

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CONTRIBUTIONS—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

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FRASER S. KEITH - - - EDITOR AND MANAGER

Vol. X Toronto, March, 1917 No. 3

The Building Outlook

According to figures just received from the City Architect and Superintendent of Buildings, Mr. Alcide Chausse, Montreal, the building permits up to the 28th of February this year show a marked increase over those of last year. For February, 1917, fifty-five permits, the value of buildings was $402,565, while for the same number of permits a year ago the value was $65,915, or less than one-sixth. During the first two months of this year a total of eighty-eight permits were issued, showing a value of $652,460. During the same period last year, there were ninety-nine permits issued, totalling $240,000.

Montreal has generally reflected the building situation in a stable, conservative manner, so that the foregoing figures would indicate that the outlook for this year in the building field was fairly good. Whether the total number of buildings, planned for the coming year, will be built is questionable. The high cost and scarcity of both materials and labor are two factors that will undoubtedly have a deterrent effect. Another and very important factor is the transportation problem, which to-day is giving the lumber manufacturers and contractors considerable concern, and is also playing an important role in respect to the price of this commodity.

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The Late Lt.-Col. S. G. Beckett

It is with sincere regret that we are called upon to chronicle the death of Lieut.-Col. Beckett, who left Toronto last year in command of the 75th Battalion. A private cable was received in Toronto on Sunday, March 4th, giving the meagre report that he had been killed in action. The late Col. Beckett was a partner of Col. Vaux Chadwick, who is also on active service, having left Canada with the Canadian Mounted Rifles. In the passing of Col. Beckett, Canada loses a gallant soldier, who had already received high commendation in the performance of his duties at the front. His loss will be felt in architectural circles, where he occupied an established position, full of promise for future accomplishment.

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The Metric System

In the last issue we published an article by Emile E. Deley on the metric system. This is a subject that has been under discussion more or less intermittently in Canada and the United States during the past fifteen years. Volumes have been written for and against the adoption of the metric system as a standard of weighing and measuring for this country. The fact that the British units adopted by us were remaining unchanged in England, made it somewhat inexpedient to consider the change in this country.

Its adoption means a complete revolution in the existing machinery gauges and standards used in all lines of manufacturing, and would entail an outlay somewhat staggering. We must, however, look at the situation in its broadest light, and peer somewhat into the future to get the proper perspective. The present epoch has seen the end of the old order of things in many instances. Even more revolutionary than the adoption of a new standard, a standard already tried and tested, the simplicity and logicalness of which is unquestioned. So it would seem that the present would be an opportune time at least for a frank declaration by the manufacturers, engineers, and scientific bodies of Canada as to their feelings in this connection.

Having two standards, the British, which is the standard both in United States and Canada, and the metric adopted by most European countries, brings about endless dissatisfaction in dealing with foreign business when the two standards come mostly into conflict.

If the organizations chiefly concerned in this question in Canada would place themselves on record, if they have not already done so, as to their ideas regarding the adoption of the metric system, they could then be presented at the postponed Economic Conference which has been announced by the Minister of Trade and Commerce, but not yet convened. This is one of the questions that should be decided at this Conference, and its importance warrants that attention be given to the subject without further delay.

Architectural Digest

Articles of More Than Passing Interest From Our Contemporaries

A CHAPTER IN THE HISTORY OF POTTERY.

The potter was the first artist. He was also the pioneer of the world's great industries. His creative instinct found its earliest expression in clay. His earthenware is contemporary with the Pyramids. Two thousand years before the Christian era he made bricks, and stamped them with the names and titles of the monarchs for whom they were manufactured. The antiquity of the art is emphasized by Homer. It contributes to the household service of the humblest cottage, and adorns the palace of the king. Pottery has provided the only existing record of the past. The pioneers of modern sanitary science have found in the potter their most useful ally, frequently anticipating the best inventions for improving the health of towns, and meeting every claim upon his ingenuity and skill.

In the last quarter of the seventeenth century two potters of Amsterdam became acquainted with the fact that at Bradwell, in the vicinity of Burslem, there was a bed of beautiful red clay, peculiarly fine in grain and color. It is thought that John Dwight, of Fulham, one of the foremost artists in clay at that time in England, supplied his two friends, or correspondents, with this valuable information. These two potters, on the strength of the English red clay, emigrated to Staffordshire and established a pottery at Bradwell in 1690, where they endeavored to imitate one at least of the foreign kind of ware. With a mixture of red clay and a little ochreous clay they made red porcelain inglazed teapots; and, by adding manganese, they produced red porcelain, or Egyptian ware. These novelties were stored at Dimsdale, about a mile distant from the work, and the buildings were said to be connected by a speaking tube. They were very jealous of their manufacturing secrets, and looked rather to strategy than to patents for their protection. One can well imagine how the foreigners would pique local curiosity. Moreover, it is easy to understand that they would not be likely to make many friends in the neighborhood, seeing that their manners were said to be somewhat supercilious; the fact being that, considering their origin and bringing up, they would not be likely to find among the local potters of the Staffordshire district of that time many cultured acquaintances. The Dutchmen kept themselves to themselves, affected, no doubt, a superior tone in their limited associations with their neighbors, and in presence of this foreign hauteur of the invaders and their great success in pottery with local clays, it is not surprising that their stratagem of secrecy was met with opposing artifice. Their very precautions must have been regarded as more or less of a challenge. John Astbury and Josiah Twyford evidently acted upon this view, as well as with a desire to advance their own practical knowledge. The Dutchmen kept a careful guard over their works against strangers. Between their establishments at Burslem and Bradwell they had a code of signals to warn each other of the approach of strangers. They selected their servants and laborers from the dullest and most stupid people they could find. They looked for hands, not heads. An idiot was employed to turn the thrower wheel. Each person was locked in the place where he was employed. Previously to the few work people retiring at night, each was subject to a strict examination. In this state the processes were pursued, when the two local potters, Twyford and Astbury, applied for employment at the works. Twyford seems to have been the first to succeed. He relied upon a carelessness and indifference of manner that went without challenge. It was not a question of assuming a virtue, though he might have it not, but of sustaining the disguise of a shrewd intelligence under the aspect of a doltish stupidity. They took him on, and he successfully played his part of an indifferent toiler who was content with his humble wage and position. Astbury appears to have found it necessary to adopt more severe shifts than Twyford, or was more resolute in his determination to master the secrets at all hazards.

After two years of this strange employment, Astbury came to the conclusion that he had no more to learn in this factory, and he availed himself of a real or feigned sickness to remain at home, and the Dutchmen had the mortification to discover that they were no longer the only persons who could make the pottery they had introduced in the district.

Disturbed, if not disgusted, with the inquisitiveness of Burslem potters, and believing in the desirability of being near the principal market for their wares, they removed to a manufactory near London, where a branch of the family is still resident.

Josiah Twyford of this incident established his works near Shelton Church and the residence of Elijah Fenton. Parts of the buildings in connection with these works, the cottages for the work people, and "Twyford Square" are still in existence; also pieces of pottery made by him are still to be found when the ground is disturbed. He died in 1799, and was buried in Stoke Church. Prior to fifty years ago operations at these works were confined to general pottery. Sanitation was in its infancy. Mr. T. W. Twyford saw that there were possibilities of great development in the art and business of the sanitary potter, who at that time was content (with few exceptions) to receive, for his share of a miscalled "Sanitary Appliance," 2s. for the earthenware, the brass and iron-founder getting from 20s. to 50s. He thought this was hardly equitable in principle, and so conceived the idea of the "National" basin, made all in earthenware, to displace the old "pan" closet and similar unsanitary systems. At first this innovation met with scant success owing to the difficulty with which old-fashioned notions and customs are superseded. During the first year of its introduction, not more than fifty were sold; the next year about two hundred; a year or two later, when its advantages, from a sanitary point of view, were generally discovered and acknowledged, the sales reached about ten thousand a year.

In the summer of 1885, when an inquiry was received through the Paris agent from a French architect of advanced views in sanitary engineering, who desired to know if he could be supplied with a basin to be fixed open and exposed, without any wood enclosure, Mr. Twyford replied in the affirmative, and at once had a design prepared and submitted to the architect, who was so well pleased with it that seven hundred were at once ordered, to be fixed in some large residential flats which were then being built under his supervision in Paris.

This basin, which was of a large type known as the "Washout," under the name of the "Unitas," was the pioneer of "Pedestal" closets, and was really the commencement of the present fixing basins open and exposed, so that all joints and connections can be examined, abolishing corners or concealed places in which dirt can accumulate unperceived.

The "Unitas" was exhibited at the Health Exhibition, 1886, and excited many comments. While on sanitary grounds the principle was commended, yet it was generally remarked that the innovation would never be popular. Indeed, had it not been for the loyal support of the medical profession, who unceasingly, in their own journals and also by their own example, advocated this new principle in sanitation, it is questionable whether it would not have been sacrificed to the conservation of old prejudices and false ideas of propriety; happily, however, science triumphed over sentiment.

The same progress and advance has been made in other branches of sanitary pottery. Lavatory basins of large size and improved construction have to a great extent taken the place of the unsatisfactory and often unsanitary wood top, marble or slate, with plug basin underneath. Indeed, it is now quite common to see fine pieces of lavatory earthenware that a few years ago it would have been deemed impossible to produce. Then, again, it is now possible to produce lavatory ranges of any length, fitted together with joints so perfect and complete that they can scarcely be detected, and forming, when complete with their stands, fittings, and pipes, real marvels of constructive sanitary art.

Architects, builders, and sanitary engineers were quick to take advantage of the practical advance in providing for the better health of towns, and Twyford's followed the agitation with an energy and inventive capacity that soon covered the country with their new sanitary appliances, which they first made chiefly for private firms, and after a time with their own name and guarantees of perfection.

Prior to this new departure at Twyfords, enamelled fireclay had been made principally in Yorkshire, at Stourbridge in Worcestershire, and in various parts of Scotland, the porcelain enamelled baths of Stourbridge being especially celebrated. From Mr. Twyford's experience in the manufacture of large pieces of earthenware in connection with his sanitary pottery, he recognized the possibility of utilizing the fireclay of the district in the production and manufacture of spcialties in the shape of sanitary and culinary vessels, sinks, cisterns and baths of a size and strength which had hitherto not been projected. A considerable time was spent in experimenting and testing the various clays, some of which, having an undue proportion of alkalis or alkali earths, would not stand the fire; others, having too great a percentage of silica, would not take the enamel; others, being too much impregnated with oxides of iron, discolored the enamel; whilst many contained other impurities which rendered them impossible for the purpose.

THE LATE LT.-COL. S. G. BECKETT

Commander of the 75th Battalion, C.E.F., who was killed on the Somme recently, particulars being still lacking. The late Lt.-Col. Beckett was a very fine officer and prior to the war practised in Toronto as an architect. He and his partner, Col. Vaux Chadwick, gave up their business to serve the Empire.

CONSTRUCTION NEWS

Information of Special Interest to Architects, Contractors, and Manufacturers.
Construction Building Reports will Give You Up-to-date Information Every
Day on all New Buildings About to be Erected or in Course of Erection.

BUILDING PERMITS.

Quebec, Que.—Permits issued at Quebec, Que., for the month of February totalled $147,000.

Stratford, Ont.—Permits issued at Stratford, Ont., for the month of February totalled $11,305.

BUSINESS BUILDINGS.

Galt, Ont.—The Gore Mutual Fire Insurance Company, Galt, have prepared plans for office alterations.

Hamilton, Ont.—Geo. Mills, 614 King street east, has been awarded the mason contract in an addition to a bank for the Bank of Montreal, to cost $6,000; G. Kenneth Rea, 59 Beaver Hall Hill, Montreal, Que., is the architect.

Quebec, Que.—Architect P. Levesque, 115 St. John street, Quebec, has prepared plans for a bank branch for La Banque Nationale, Quebec City, to cost $3,000.

Niagara Falls, Ont.—Wm. Mullen, Victoria avenue, has been awarded the painting and glazing contracts in a bank for the Royal Bank of Canada; May Electric Company, Niagara Falls South, have been awarded the electric wiring contract; Ireland & Dinham, Glenholme avenue, are the general contractors; C. M. Borter, Main street, is the architect.

Windsor, Ont.—J. Rutherford, 1000 Wellington street, London, has commenced work on an office building for the Huron and Erie Mortgage Corporation, London, to cost $65,000; Watt & Blackwell, Bank of Toronto Building, London, are the architects.

CIVIL ENGINEERING.

Fredericton, N.B.—B. F. Smith, Minister of Public Works, has received tenders for the erection of a bridge over the Kennebecasis River.

Ottawa, Ont.—The city of Ottawa contemplates the erection of a bridge at the foot of St. Patrick street and Rideau River, to cost $150,000.

Peterboro, Ont.—The town of Peterboro contemplates the erection of a bridge across Hunter street.

Toronto, Ont.—The Wm. Davies Company, 521 Front street east, has prepared plans for a bridge to be erected on Front street east, to cost $2,500; Wells Bros. Co. of Canada, Ltd., Church street, have been awarded the general contract.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Gravenhurst, Ont.—The National Sanitarium Association, 238 College street, Toronto, contemplates the erection of hospital buildings.

Hamilton, Ont.—H. Guest contemplates remodelling the Strand Theatre, to cost $10,000.

Hamilton, Ont.—E. R. Gray, City Engineer, City Hall, has prepared plans for moving and repairing of the club house for the Victoria Yacht Club, to cost $7,000.

Hamilton, Ont.—J. M. Peregrine, 74 Queen street south, contemplates the erection of a theatre, to cost $75,000. H. Guest, 755 King street east, contemplates an addition to his theatre, to cost $15,000.

Hamilton, Ont.—Samuel Howard, 231 Mary street, has been awarded the mason contract in altering a hotel into apartments for Miss Edwards, to cost $10,000; Murry & Connor, 158 Victoria avenue, have been awarded the carpenter contract; Adam Clark, 7 Main street west, has been awarded the plumbing contract; Stewart & Witton, Hamilton, Provincial and Loan Building, are the architects.

Kitchener, Ont.—Work on the hospital for the Sisters of Charity will commence in the spring.

Montreal, Que.—Messrs. C. E. Deakin Construction Company have commenced work on the new wing to the Algonquin Hotel for the Canadian Pacific Railway Company.

Nelson, B.C.—The directors of the Kootenay Lake General Hospital Board estimated that it will cost about $85,000 to finish their hospital, which is now under construction.

Renfrew, Ont.—The Renfrew Hotel Company will erect an addition of forty rooms to their hotel.

Renfrew, Ont.—Architect W. E. Noffke, 45 Rideau street, Ottawa, is preparing plans for an hotel addition for the Renfrew Hotel Company.

South Porcupine, Ont.—The Township of Tisdale, South Porcupine, contemplates the erection of a hospital.

Windsor, N.S.—The trustees of King's Hospital, Windsor, N.S., contemplates the erection of an addition to their hospital, to cost $1,000,000.

FIRE LOSSES.

Arborg, Man.—The Arborg Hotel was destroyed by fire; loss $30,000.

Amherst, N.S.—The Empress Theatre was destroyed by fire; loss $25,000.

Battleford, Sask.—The store of White & Joliffe and other buildings at Battleford were destroyed by fire.

Brockville, Ont.—The Isolation Hospital of the town of Brockville was destroyed by fire.

Calgary, Alberta.—Three stores in the town of Okotoks were destroyed by fire; loss $30,000.

Elstow, Sask.—The hotel at Elstow was destroyed by fire.

Ellice Township, Ont.—St. Paul's Lutheran Church was destroyed by fire; loss $20,000.

Fort William, Ont.—Chapples, Limited, departmental store was destroyed by fire; loss $125,000.

Galt, Ont.—Ross D. Bailey's bungalow was destroyed by fire; loss $6,000.

Gravenhurst, Ont.—E. Long Manufacturing Company's foundry and machine shop was destroyed by fire; loss $20,000.

Halifax, N.S.—The business premises on Gottingen street were destroyed by fire; loss $40,000. The smoke house of the North Atlantic Fisheries was destroyed by fire.

Hamilton, Ont.—Grafton & Co.'s store building was destroyed by fire; loss $150,000.

Kenora, Ont.—The Vereker Block was destroyed by fire; loss $10,000. The Zion Methodist Church was destroyed by fire; loss $20,000.

Kenora, Ont.—The Fullerton business block was destroyed by fire; loss $15,000. The King Edward Hotel was destroyed by fire; loss $40,000.

Moncton, N.B.—The Minto Hotel Building was destroyed by fire; loss about $40,000.

Oshawa, Ont.—W. J. Trick & Co.'s factory was destroyed by fire.

Peterboro, Ont.—The Canadian General Electric Company's building and machinery were destroyed by fire; loss $25,000.

Phoenix, B.C.—The Dominion Hotel was destroyed by fire; loss $1,000.

Port Hope, Ont.—John Walker's store was destroyed by fire; loss $7,000.

Quebec, Que.—The dry goods store of Simard & Carmichaels, on St. Joseph street, was destroyed by fire.

Quebec, Que.—Three buildings were destroyed in the business section of St. Roch's Ward; loss $150,000.

Quebec, Que.—The biscuit factory of W. Charest and the sausage factory of G. Gouillard were destroyed by fire; loss $25,000.

Sarnia, Ont.—Mrs. T. K. Crinnian's hotel was destroyed by fire; loss $20,000.

Sherbrooke, Que.—The plant of MacKinnon-Holmes Company was destroyed by fire; loss $30,000.

Simcoe, Ont.—The Simcoe Lithographing Company's plant was destroyed by fire; loss on the plant was $150,000, and on the equipment about $200,000.

Sudbury, Ont.—The freight sheds of the Canadian Northern Railway at Sudbury were destroyed by fire.

St. Hyacinthe, Que.—Emile Bouchard's business building was destroyed by fire; loss $20,000.

St. John N.B.—The Kennedy Building was destroyed by fire; loss about $20,000.

St. Thomas, Ont.—Norsworthy & Co.'s foundry was destroyed by fire; loss $20,000.

Toronto, Ont.—Bingham's, Limited, palm garden and tea room were destroyed by fire; loss $15,000.

Toronto, Ont.—The foundry of the Queen City Foundry Company was destroyed by fire; loss $30,000. The Stanley Piano Co.'s (241 Yonge street) warehouse on Temperance street was destroyed by fire; loss $10,000.

Winnipeg, Man.—The Parkview Annex on Carlton street was destroyed by fire; loss $25,000.

Winnipeg, Man.—The warehouse of the James Stewart Stove Company was destroyed by fire; loss $250,000.

Winnipeg, Man.—The Great West Saddlery Company building at Winnipeg was destroyed by fire; loss $40,000.

Winnipeg, Man.—The warehouse of Jobin-Marrin Company was destroyed by fire; loss $150,000. The business building of Scott, Bathgate Company, Limited, was destroyed by fire; loss $200,000.

MISCELLANEOUS.

Brantford, Ont.—Architect W. C. Tilley, Dalhousie street, is preparing plans for a boiler house addition for the Water Commissioners, City Hall. The Waterous Engine Co., Brantford, Ont., have been awarded a contract for the erection of a smoke stack for the city of Brantford.

Chatham Township, Ont.—Arphax Hin, 100 Murray street, Chatham, has been awarded the general contract for the erection of a stock barn for John Johnson.

Collingwood, Ont.—Architect John Wilson, Hourontario street, has prepared plans for a garage for Smalley & Toms, Collingwood.

Cornwall, Ont.—The Cedar Rapids Transmission Company are preparing plans for a power and transformer station.

Fairbanks, Ont.—Walter Freeland contemplates the erection of an abattoir.

Guelph, Ont.—The Board of Parks Management contemplates the erection of a public lavatory at the Exhibition Park. The Board of Parks Management contemplates the erection of a band stand at St. George's Park.

Halifax, N.S.—J. Downey, a wealthy New Yorker, contemplates the erection of a four-million-dollar ship building yard at Halifax, N.S.

Hamilton, Ont.—Thomas Myles & Son, 8 James street north, contemplates the erection of coal sheds on Ferguson avenue north, to cost $9,000. The city of Hamilton contemplates the erection of a grand stand and exhibit buildings on Tuckett's farm.

Hamilton, Ont.—The International Harvester Company contemplates the erection of a dock and warehouse extensions, to cost $40,000.

Hamilton, Ont.—Isbister Bros., 65 Hughson street, have been awarded the general contract for the erection of a garage on Charles street, to cost $20,000; McPhie & Kelly, Bank of Hamilton Building, are the architects. Architect W. G. Brown, Clyde Block, is preparing plans for a parish hall for the Diocese of Niagara (Bishop Clark, Hamilton), to cost $10,000. Jas. Jolley & Son, 51 John street south, contemplate the erection of a garage, to cost $25,000. Architect E. R. Gray, City Engineer, is preparing plans for coal sheds for the city of Hamilton.

Hamilton, Ont.—The Ottawa Contractors, Limited, Catherine street north, have commenced work on a dock extension and repairs for the Park Board, to cost $6,000. Henry Walsh, 159 Sanford street, Hamilton, will build a garage on Charles street, to cost $20,000; McPhie & Kelly, Bank of Hamilton Building, are the architects; Isbister Bros., 65 Hughson street, are the general contractors. Architect W. A. Edwards, Hamilton Provincial and Loan Building, is preparing plans for a garage for Jolley & Sons, 51 John street south, to cost $50,000. Williamson & Torrance, 469 King street east, contemplates the erection of a garage on Main and Walnut streets, to cost $50,000.

Lindsay, Ont.—The town of Lindsay contemplates improvements to the town hall and market building, to cost $5,000.

Montreal, Que.—The Riordan Pulp and Paper Company contemplates the erection of a new sulphite plant.

New Toronto, Ont.—The West Point Lodge, 425, I.O.O.F., contemplates the erection of a lodge building.

New Westminster, B.C.—Sloan & Harrison, New Westminster, have been awarded the general contract for the erection of freight sheds.

Niagara Falls, Ont.—The project for the erection of a Y.W.C.A. building has been dropped until a later date.

Ottawa, Ont.—The highest dam in the world will be built over the Pend Oreille River.

Ottawa, Ont.—The city of Ottawa contemplates the erection of industrial farm buildings, to cost $50,000.

Paris, Ont.—Hewson & Potter, 127 Erie avenue, Brantford, Ont., have been awarded the plastering contract in a Y.W.C.A. for Penmans, Limited; Schultz Bros. Co., Ltd., Brantford, are the general contractors; Frank Nichol, Temple Building, Brantford, is the architect.

Paris, Ont.—Schultz Bros. Company, Limited, Brantford, have been awarded the general contract for the erection of a Y.W.C.A. for Penmans, Limited, to cost $15,000; the Brantford Roofing Company have been awarded the roofing contract; R. C. Chave, 17 Pearl street, Brantford, has been awarded the painting and glazing contract; Webster Electric Company, 211 Colborne street, have been awarded the electric wiring contract; Anguish & Whitfield, 40 Colborne street, have been awarded the heating and plumbing contract.

Port Arthur, Ont.—Barnett-McQueen Company, Fort William, Ont., have been awarded the general contract for the erection of grain elevators for the Eastern Terminals Company.

Regina, Sask.—Mr. George Cook, of Regina, contemplates the erection of a flour mill at Regina

Smith's Falls, Ont.—James McDonald, Smith's Falls, has been awarded the general contract for building twelve miles of road at St. Clet, near St. Polycarpe, to cost $90,000.

Toronto, Ont.—Plans have been drawn for a garage for Moore & Harrison, 2032 Queen street east, to cost $11,000.

Toronto, Ont.—Jackson-Lewis Company, Bell Telephone Building, have been awarded the general contract for the erection of a shed and garage for the Canadian Aeroplanes, Ltd., to cost $9,000; J. M. Lyle, 19 Avondale road, is the architect.

Toronto, Ont.—L. E. Dowling, 167 Yonge street, has been awarded the general contract for the erection of a concrete tank for the American La Fracne Fire Engine Co., 195 Weston road. Architect P. H. Finney, 79 Adelaide street east, has prepared plans for a public garage and residence for the Mutual Motors Co., 64 Woodycrest avenue, to cost $10,000.

Trenton, Ont.—The Imperial Munitions Board, Ottawa, has prepared plans for a Y.M.C.A. to be erected at Trenton, Ont., to cost $12,000.

PLANTS, FACTORIES AND WAREHOUSES.

Bridgeburg, Ont.—The Genessee Pure Food Company, Leroy, N.Y., contemplates the erection of a factory at Bridgeburg.

Gravenhurst, Ont.—E. Long Manufacturing Company, Orillia, will rebuild their factory, which was destroyed by fire.

Haileybury, Ont.—The Riordan Pulp and Paper Company contemplates the erection of a sulphite mill.

Hamilton, Ont.—T. R. Sloan, Federal Life Building, contemplates the erection of a storage plant, to cost $50,000.

Hamilton, Ont.—Architects McPhie & Kelly, Bank of Hamilton Building, are preparing plans for a newspaper plant for the Spectator Printing Co., James street south.

Hamilton, Ont.—W. T. Rawleigh Medicine Company, Duchess street, will erect a factory to cost $100,000; McPhie & Kelly, Bank of Hamilton Building, are the architects.

Hamilton, Ont.—Architect W. H. Yates, 24 Leeming street, has prepared plans for a factory addition for the National Paper Goods Company, 144 Queen street north, to cost $10,000.

Hamilton, Ont.—H. C. Gummo, 15 Tuckett street, has been awarded the general contract for the erection of a warehouse for C. Miles, 95 King street east, to cost $5,000; J. Mercer, 72 Barton street east, has been awarded the carpenter contract.

Hamilton, Ont.—Geo. E. Mills, 614 King street east, has been awarded the general contract for the erection of an addition to the factory of Chipman-Holton Knitting Company, 122 Mary street, to cost $50,000; McPhie & Kelly, Bank of Hamilton Building, are the architects.

Hamilton, Ont.—Architect G. J. Hutton, Bank of Hamilton Building, is preparing plans for a departmental store for Grafton & Co., James street north, to cost $100,000. The city of Hamilton contemplates the erection of a coke oven and gas plant, to cost $2,000,000.

Hamilton, Ont.—Architects Prack & Perrine, Lumsden Building, Toronto, have prepared plans for a factory for the Carbon and Alloy Steels, Limited, to cost $100,000. Adam Clark, 7 Main street west, has been awarded the heating and plumbing contract in a factory for the Tallman Brass and Metal Company, to cost $50,000; Stewart & Witton, 7 Hughson street, are the architects.

Lindsay, Ont.—The Boving Hydraulic and Engineering Company contemplates the erection of a factory addition.

St. Catharines, Ont.—The Steel and Radiation, Limited, Toronto, will extend their plant at St. Catharines.

Toronto, Ont.—The Ajax Rubber Company, Trenton, N J., contemplates the erection of a factory.

Toronto, Ont.—B. F. Johnson Soap Company, Ltd., 155 George street, contemplates the erection of a factory.

Toronto, Ont.—Frank Stanley, 241 Yonge street, will repair their warehouse on Temperance street, which was destroyed by fire.

Toronto, Ont.—Engineers Harkness & Oxley, Confederation Life Building, are preparing plans for a factory for the Willards Chocolates, Ltd., 260 Spadina avenue.

Toronto, Ont.—The Dominion Bridge Company, Imperial Life Building, have been awarded the steel work contract on a warehouse for Baines & Peckover, to cost $25,000, at the foot of Cherry street. Geo. Nicholson, 61 Clinton street, has commenced work on factory repairs for Robert Watson, 363 Sorauren avenue, to cost $5,000.

Toronto, Ont.—John V. Gray Construction Company, Confederation Life Building, have been awarded the general contract for the erection of a warehouse and garage for Clarkson-Jones estate, Home Life Building, to cost $18,000; Port Credit Brick Company, McKinnon Building, have been awarded the facing brick contract; the Don Valley Brick Company, Dominion Bank Building, have been awarded the back brick contract; Seaman-Kent Company, 263 Wallace avenue, have been awarded the maple floor contract.

Toronto, Ont.—W. Williamson, 137 Woodbine avenue, has been awarded the general contract for the erection of an addition to the warehouse of E. Leadley & Co., 87 Front street east, to cost $25,000; G. H. Weale & Son, 18 Applegrove avenue, has been awarded the mason contract; W. T. Stewart, 110 Church street, has been awarded the roofing contract; Feather & Roadhouse, 11 Foster place, have been awarded the sheet metal contract, Geo. S. Egles, 880 Queen street, has been awarded the electrical wiring contract; Otis-Fensom Company, 50 Bay street, have been awarded the elevator contract.

Windsor, Ont.—Architect A. H. McPhail, Board of Trade Building, Windsor, is preparing plans for a cigar factory for Brener Bros., 184 Horton street, London, Ont., to cost $100,000.

Woodstock, Ont.—W. J. Taylor, Woodstock, has been awarded the general contract for the erection of an addition to the factory of the Harvey Knitting Company.

PUBLIC BUILDINGS AND STATIONS.

Hamilton, Ont.—The city of Hamilton contemplates the erection of a sub-station on Gage avenue, to cost $20,000.

Hamilton, Ont.—The Canadian Northern Railway Company, Toronto, contemplates the erection of a station on James and Murray street, to cost $250,000.

RESIDENCES, STORES AND FLATS.

Brockville, Ont.—Architect A. Stuart Allaster, Brockville, Ont., is preparing plans for a residence for W. Gilbert, Cincinnati, Ohio, to cost $50,000.

Guelph, Ont.—Johnson & Williams, Central street, have been awarded the mason, cut stone and concrete contracts in a residence for Alvar H. Simpson, to cost $6,500; G. C. Walker, Tiffany street, has been awarded the carpenter contract; Fred Smith, Quebec street, has been awarded the plumbing and heating contract; Albert Smith Company, Ltd., Cork street, has been awarded the sheet metal contract; W. A. Cowan, 149 London road, is the architect.

Hamilton, Ont.—George F. Webb, Mountain Top, contemplates the erection of apartments and stores, to cost $75,000.

Hamilton, Ont.—H. Crosthwaite, 160 Alanson street, contemplates the erection of a residence on Sherman avenue south, to cost $7,000.

Hamilton, Ont.—The Stanley Mills, Limited, James street north, will rebuild their departmental store, which was destroyed by fire. W. O. Seeley, 61 Hunter street west, contemplates the erection of an apartment house to cost from $20,000 to $25,000.

Lindsay, Ont.—I. E. Weldon, Kent street, contemplates the erection of a residence.

Oshawa, Ont.—The Oshawa Development Company, 33 Richmond street west, Toronto, contemplates the erection of residences.

Ottawa, Ont.—McFarlane-Douglas Co., Slater street, Ottawa, have been awarded the roofing contract on an alteration to a teachers' residence for Grey Nuns, to cost $45,200; J. Bourque, 137 Notre Dame street, Hull, Que., has been awarded the carpenter contract; L. Lemieux, 140 Laurier avenue, and Hector Leblanc, Kent street, Hull, are the general contractors; J. Chene, 163 Notre Dame street, Hull, Que., is the architect.

Ottawa, Ont.—Wm. Campbell, 70 Spruce street, has been awarded the mason contract in a shop and residence for F. W. Burn, 673 Somerset street, to cost $10,000; Ed. Wentzliff, 249 MacKay street, has been awarded the carpenter contract; R. J. Cameron, 488 Lewis street, has been awarded the sheet metal contract; Murphy & Morrow, Ottawa, have been awarded the plastering contract; Duford, Limited, 70 Rideau street, has been awarded the painting and glazing contract; J. A. Ellacott, 226 Bank street, has been awarded the electric wiring contract; J. A. Blyth, Front street, has been awarded the heating and plumbing contract; W. E. Noffke, Plaza Building, is the architect.

Toronto, Ont.—Plans have been prepared for a residence for

R. J. MacLennan, 30 Murray street, on Oriole Parkway, to cost $7,000.

Toronto, Ont.—The Dominion Bridge Co., Imperial Life Building, have been awarded the steel work contract; also the Bethlehem Steel Company have an order for 10,000 tons of steel for the departmental store for the T. Eaton Co., Ltd., Yonge street, to cost $5,000,000; Graham, Burnham & Co., Chicago, Ill., are the architects; Sproatt & Rolph, 36 North street, are the associate architects.

SCHOOLS, COLLEGES AND CHURCHES.

Belleville, Ont.—The Board of Education contemplates the erection of a collegiate at Belleville.

Charlottetown, P.E.I.—Architects C. B. Chappell & Hunter, Charlottetown, have prepared plans for a new Catholic church, to cost $60,000.

Creemore, Ont.—Joseph Akitt, Creemore, Ont., has been awarded the general contract for the erection of a school for the town of Creemore, to cost $17,940; T. C. Palin, Collingwood, is the architect.

Elmvale, Ont.—Dillon Bros. & Reckie, Collingwood, Ont., have been awarded the general contract for the erection of a school for the trustees of the Separate School No. 5, Flos, Elmvale, to cost $21,000; John Wilson, Collingwood, is the architect.

Hamilton, Ont.—The Board of Education, City Hall, Hamilton, contemplates the erection of a school, eight rooms, to cost $50,000.

Hamilton, Ont.—The Board of Education, City Hall, contemplates the erection of a technical school, to cost $2,000,000, on Wentworth street north.

Hamilton, Ont.—W. H. Yates, Jr., 15 Leeming street, has been awarded the mason contract in a school addition for the Board of Education, G. J. Hutton, Bank of Hamilton Building, is the architect.

Kitchener, Ont.—The Public School Board of Kitchener contemplates the erection of alterations to the Sunday school.

Lindsay, Ont.—The Monsignor Casey Roman Catholic Church have purchased a site for the erection of a church.

New Liskeard, Ont.—The Provincial Architect has prepared plans for an agricultural high school for the Department of Lands, Forests and Mines, Toronto.

McGregor, Ont.—K. L. Dufour, Aylmer avenue, Windsor, Ont., has been awarded the general contract for the erection of a school to cost $7,000 for the Board of School Trustees; G. Jacques & Co., Peninsular Security Building, Windsor, are the architects.

Oakville, Ont.—The Board of Education contemplates the erection of a school at Oakville to cost $35,000.

Parry Sound, Ont.—George P. White, Parry Sound, Ont., has been awarded the general contract for the erection of a school, six rooms, for the Public School Board, to cost $30,000; Angus & Angus, North Bay, Ont., are the architects.

Steelton, Ont.—The Methodist congregation, Steelton, contemplates the erection of an addition to a Sunday school; Rev. E. Peacock, pastor.

Sandwich West, Ont.—Alexander Tourangeau, 14 Bridge avenue, Sandwich, has been awarded the general contract for the erection of a school for the Trustees of the Separate School No. 1, Sandwich West, to cost $8,890; G. Jacques & Company, Peninsular Security Building, Windsor, are the architects.

CATALOGUES and BOOKLETS

Hollow Metal Construction.—The Dahlstrom Metallic Door Company has recently compiled a portfolio containing thirty plates, illustrating and showing details of construction and installation of metal doors and trim. The drawings referred to are made to large scale, and include every type of door and trim produced. No expense has been spared in producing this portfolio, and it should prove of immense value to architects. Other literature is also offered by this company, in which information relative to fireproofing the modern building is presented. Copies of these books will be sent by addressing the Dahlstrom Metallic Door Company, Jamestown, N.Y.

Canadian Firm's Activities in Latin America—Jenkins Bros., Limited, Montreal, Canada, manufacturers of brass and iron body valves of every description, have more securely entrenched themselves in the leading markets of South America, having lately sent a special representative to look over the situation with a view to extending trade relations there. The territory having been traversed successfully, a follow-up system has been inaugurated whereby their products will be given all publicity possible. In this connection they have issued new catalogues one No. 8-S., printed in the Spanish language, and another, No. 8-P., in Portuguese, both of which fully describe and illustrate valves and mechanical rubber goods suitable for the requirements of up-to-date power and industrial plants, mines and office buildings. Valves with screwed ends are supplied tapped with either American or British standard threads to meet the demands of customers in other lands.

"Water Powers of Manitoba, Saskatchewan and Alberta," a well-bound and attractively illustrated volume just issued by the Commission of Conservation, forms a valuable contribution to the authentic literature respecting the natural resources of Western Canada. This report, by Leo G. Denis and J. B. Challies, comprises the results of special surveys by the Commission of Conservation and a compilation of records from other reliable sources. As a compendium of all available data on the subject, it is particularly valuable for reference purposes. While the Prairie Provinces, as a whole, are not lavishly endowed with water-powers, the report demonstrates that the utility of their rivers for power development can be vastly enhanced through proper storage of flood waters. At present, in the absence of conservation dams, and of adequate natural regulation, the great volume of flow is lost during high water seasons. Methods of development to ensure the maximum utilization are now being carefully worked out on the Winnipeg, Bow and other large rivers. The more northerly regions possess numerous sites of great potential value for pulp, electro-chemical and other special industries. The report just issued is the second in the series on water-powers in Canada to be published by the Commission of Conservation. The third volume, "Water Powers of British Columbia," which is now in press, will complete the Commission's general inventory of this item of the Dominion's natural wealth.

A Booklet on the Stained Glass of Mr. Horace Wilkinson.—Attention is called to the fact that the illustrations in this booklet are reproductions from water color designs and not from the actual windows. As his larger sketches would have to be so greatly reduced in size, the details not being easily seen, he has reproduced the drawings solely to prove that he is conversant with the chief styles adopted for modern windows. Wherever possible, it is always best for donors of windows to see examples of work, **in situ**, before placing an order with any artist whose work is not known to them, for so much depends upon the coloring and the method of glass painting, and these points are better seen in a window than in any colored copy, however skillful the lithographer, and a highly finished sketch is no proof at all that the glass shall be of the same excellence. He gives, therefore, a list of his windows, and, as in some cases, the churches mentioned possess windows previously obtained from other studios, an opportunity of comparison is afforded.

Mr. Horace Wilkinson has had twenty-nine years' practical experience, seven years of which were spent in London studios each under Royal patronage. Three years were spent abroad, after which he started his own studio and workshops. He is conversant with all styles and periods of Gothic glass, and has his own studies of the old glass at York Minster, All Saints', St. Martin's, and other churches in York; Malvern Abbey, Gloucester Cathedral, Canterbury Cathedral, Fairford, New College, Oxford; S. Ouen, Rouen, Cologne Cathedral, and other English and French centres of mediæval glass painting.

He had the honor of being selected by Mr. W. D. Caroe, M.A., F.S.A., etc., Architect to the Ecclesiastical Commissioners, Canterbury Cathedral, Great Malvern Priory Church, Southwell Minster, etc., etc., to execute the first of the proposed new series of windows for Winchester College Chapel. The first panel (St. Jude) is now fixed (north side, window nearest east), but at present it has a temporary coat of pigment over the whole, to keep it in harmony with the surrounding Georgian glass, which, being of a decadent period of glass painting, has none of the brilliancy and sparkle of the glass of William of Wykeham's time, when the original windows were made.

Mr. Caroe's subsequent orders form quite one-third of list on page seven.

Among the many unsolicited testimonials which he has had the pleasure of receiving (nearly all of which mention the beauty of the color scheme), only one is reproduced here. This was received from Mr. C. E. Ponting, F.S.A., Consulting Architect to Salisbury Cathedral, also Diocesan Surveyor to Bristol, and refers to the first window that he placed with Mr. Wilkinson. It is chosen because of the architect's previous acquaintance with the work of other London studios.

Several of the churches on the list are other orders from Mr. Ponting.

Copies of this booklet may be had by addressing Mr. Horace Wilkinson, Artist in Stained Glass, 68 Great Russell Street, London, W.C.

NEW TECHNICAL SCHOOL, HAMILTON, ONT.

A committee of the Board of Education of Hamilton, Ont., has recommended that architects be invited to submit competitive plans for the Technical School and the carrying out of the project at once. The estimated cost of this school is $500,000 or over.

BRITISH COLUMBIA'S NEW CHIEF FORESTER.

Mr. M. A. Grainger, who has been acting chief forester for British Columbia since Mr. H. R. MacMillan's appointment as lumber commissioner to study foreign markets, has been appointed chief forester. Mr. Grainger is a graduate of King's College, Cambridge, where he took a high standing in mathematics. He came to Canada in 1897, served during the South African War, gaining the South African medal with six clasps, and returned to British Columbia, where he engaged in logging. He joined the Forestry Branch upon its inauguration, and has occupied an important post in it ever since.

FEDERAL CONSTRUCTION ESTIMATES.

In the estimates submitted by the Finance Minister, $1,000,000 was voted to Victoria for the purpose of completing harbor works by the special harbor and river committee. Toronto, St. John, and Quebec secured equal amounts of $1,000,000. Port Arthur and Fort William secured $750,000 each.

General harbor and river votes for British Columbia include the following: Fraser River (lower), improvements, $20,000; harbor and rivers, generally, repairs and improvements, $75,000; Holberg, repairs to wharf, $3,300; James Island, repairs to wharf, $750; Metchosin, repairs to wharf, $1,700; Prince Rupert, Quarantine Station, repairs to wharf, $1,500; Quatsino, repairs to wharf, $4,300; Sidney Island, repairs to wharf, $2,200; Stikine River, improvements, $5,400; to purchase supply of creosoted timber for use in repairing wharves, $10,000; Union Bay, repairs to wharf, $6,500; Vargus Island, repairs to wharf, $2,100; William Head Quarantine Station, improvements and repairs, $3,500.

The main estimates provide for an expenditure of $203,472,765, as compared with $271,015,545 voted last year.

SOUND TRANSMISSION, REFLECTION AND ABSORPTION.

Acoustically architectural and engineering structures cannot be said to excel, and the builder may justly complain that scientists do not give him much guidance as to the acoustical behavior of his materials and structures. In his experiments on the transmission, reflection and absorption of sound, Professor F. R. Watson, of the University of Illinois (Physical Review, vol. vii, pages 125 to 132), made use of the following arrangement. He placed the source of sound in one room, and the receiver in another, the two rooms communicating by a door. The source was an adjustable whistle blown by air at constant pressure and mounted in the focus of a parabolic reflector. The receiver was a Rayleigh resonator in which a mica plate, suspended by a quartz fibre at 45 deg. to the direction of the sound, was turned more or less about its vertical axis by the arriving sound waves. The waves travelled through the door, which was either open, or closed by one or more superposed panels of the respective material. The deflections observed were not steady, and some peculiar observations were made. With the door open the deflections amounted to about forty divisions, measured by a cathetometer. When the door was closed by the panels the deflections were, of course, smaller; but several layers of the same material had not always the effect to be expected from measurements made on one layer. Thus the deflection with one layer of different materials, ½-in. hair felt, ¼-in. cork board, ¾-in. cork board, ¼-in. paper-lined hair felt, ¾-in. of same, ¾-in. flax board, ¼-in. pressed fibre, ¾-in. of same, were, respectively, 22.6, 7.9, 1.15, 5.0, 6.5, 2.25, 0.32, 0.2, so that one layer of hair felt stopped least of the sound (only 43 per cent.), whilst the cork board stopped 80 and 90.5 per cent., and the pressed fibre barred practically all the sound. But the figures for one, two and three layers of hair felt were 22.6, 15.4, 10.4; for ¾-in. cork board, 1.15, 2.05, 0.85; for ¼-in. lined hair felt, 5.0, 21.7, 3.8; and for ¾-in. lined hair felt, 2.25, 0.55, 0.1. Thus two layers of cork stopped less sound than either one layer or three layers, and two layers of the ¼-in. paper-lined hair felt behaved still more abnormally compared with one and three layers of the same material. The further investigation showed that reflection, absorption, resonance, and other effects come in. To study these the sound was sent obliquely towards the door; the reflected sound was measured, and the absorbed calculated by difference, assuming that the sound can only be transmitted, reflected or absorbed, and that the three fractions together ought to make up the unit value of the whole incident sound. Arranging the materials as before, the following reflections were observed, again for one, two and three layers: hair felt, 19, 25, 40; ¼-in. cork, 61, 55, 87; ¾-in. cork, 100, 82, 85; ¼-in. paper-lined hair felt, 80, 23, 39; ¾-in. same, 40, 25, 36; ¾-in. flax board, 87, 77, 77. The amount of sound reflected and absorbed increased in most cases with the thickness, while the transmission decreased. But in the ¼-in. paper-lined hair felt reflection and transmission followed each other closely (as Professor Watson's curves clearly indicate), both being anomalous, and that is probably accounted for by resonance; certain thicknesses of the materials vibrate vigorously under the action of the sound, setting up new waves. This explanation was suggested in similar researches made by a different method in 1910 by Weisbach; porosity, density and elasticity of the material have to be considered. Porous bodies like hair felt probably transmit sound like air, and a denser material stops more sound than the same thickness of a less dense material. Thus pressed fibre cuts off the sound better than the same thickness of oak. Elastic materials vibrate in resonance to the source, creating sound waves of the same character on the further side. Hence they act as if there were no partition wall. The two thicknesses of paper-lined hair felt probably approximated such a vibration.

◆

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Architects, Clinton & Russell, New York; J. L. Havill, resident architect, Toronto.

◆

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Architects, engineers and contractors are invited to contribute information on construction work, whether it be proposed or in progress, and such information will be published in these columns.

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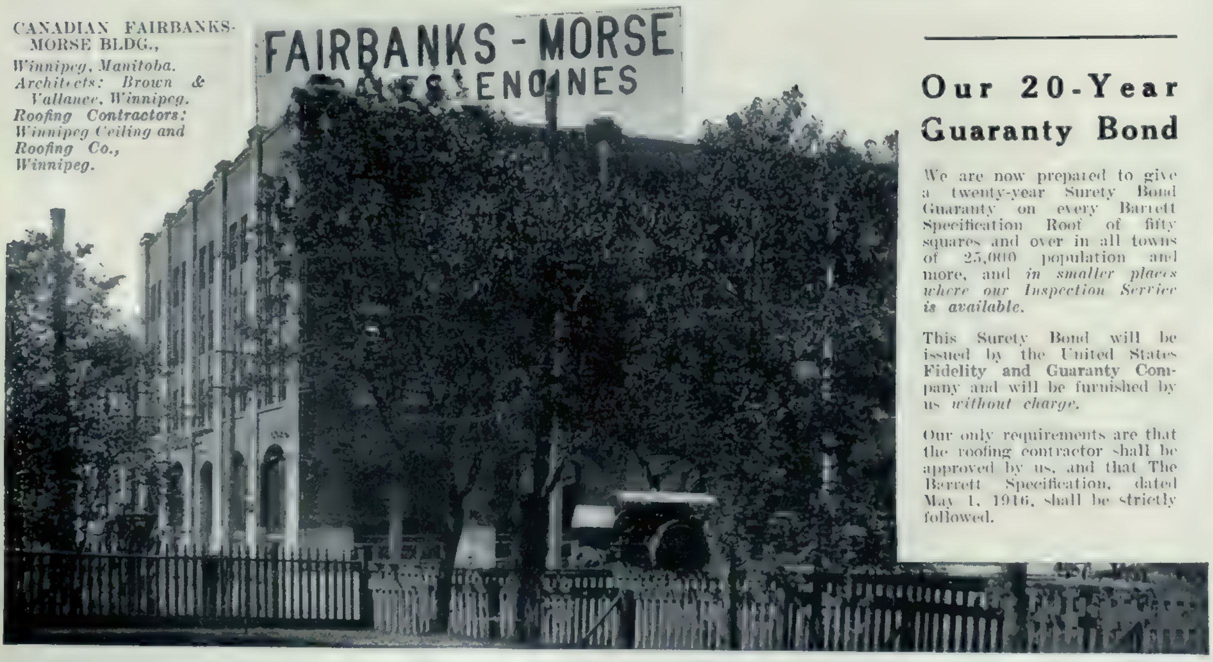

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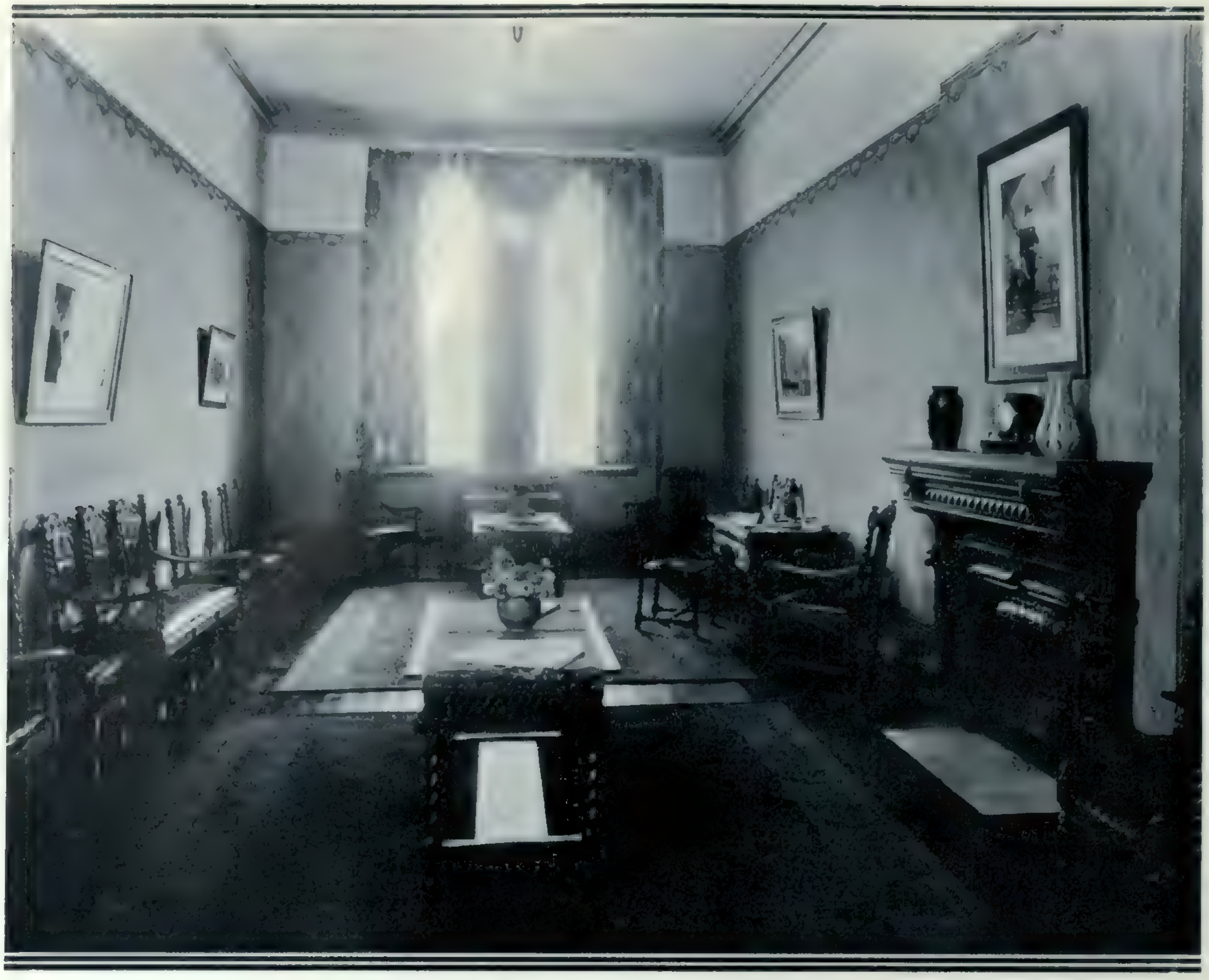
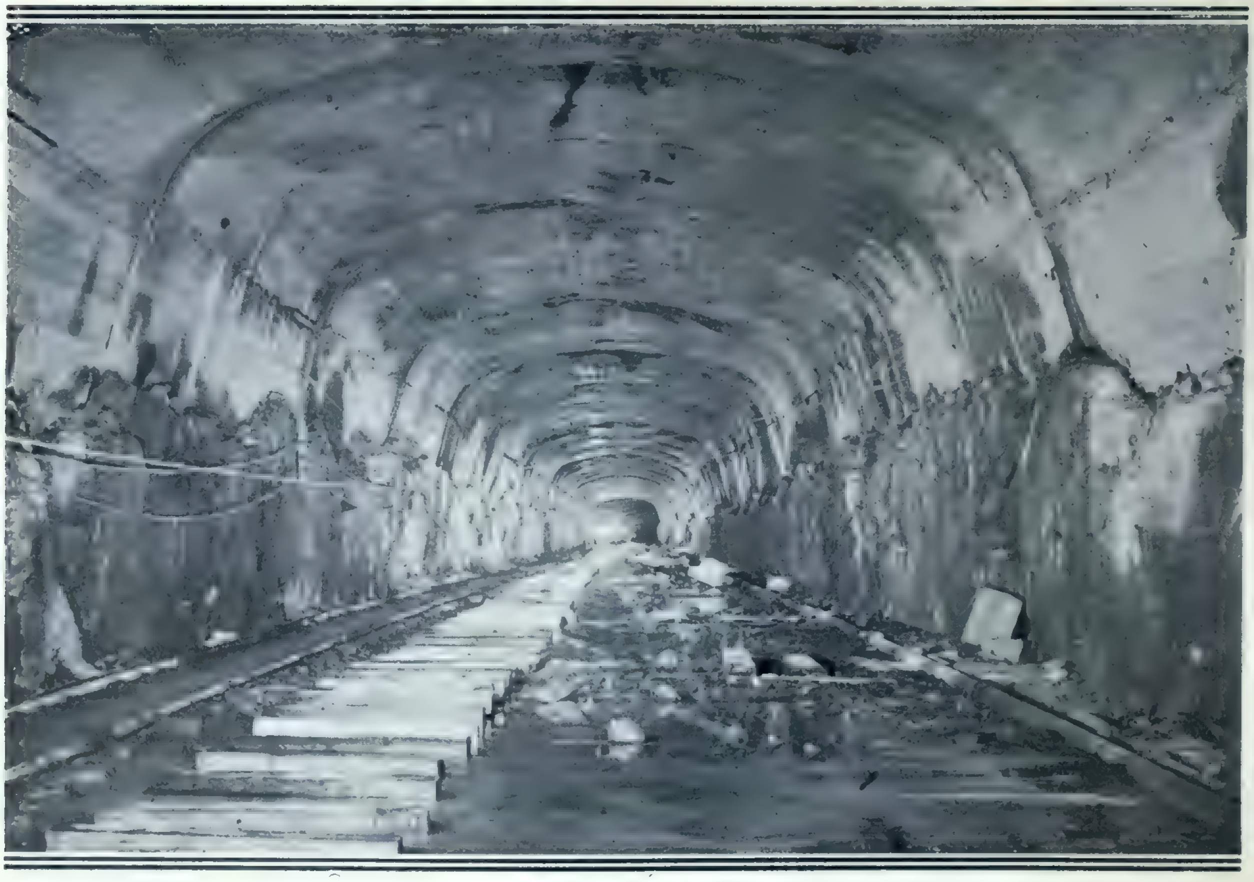


IN THE SOLDIERS' HOSPITAL.

This waiting-room was furnished by the A. F. and A. M. for the Military Hospital, Toronto (Old Knox College), and is one of the pleasantest rooms in the institution.



THE C.N.R. TUNNEL AT MONTREAL.

CONSTRUCTION

April, 1917 Vol. 10, No. 4

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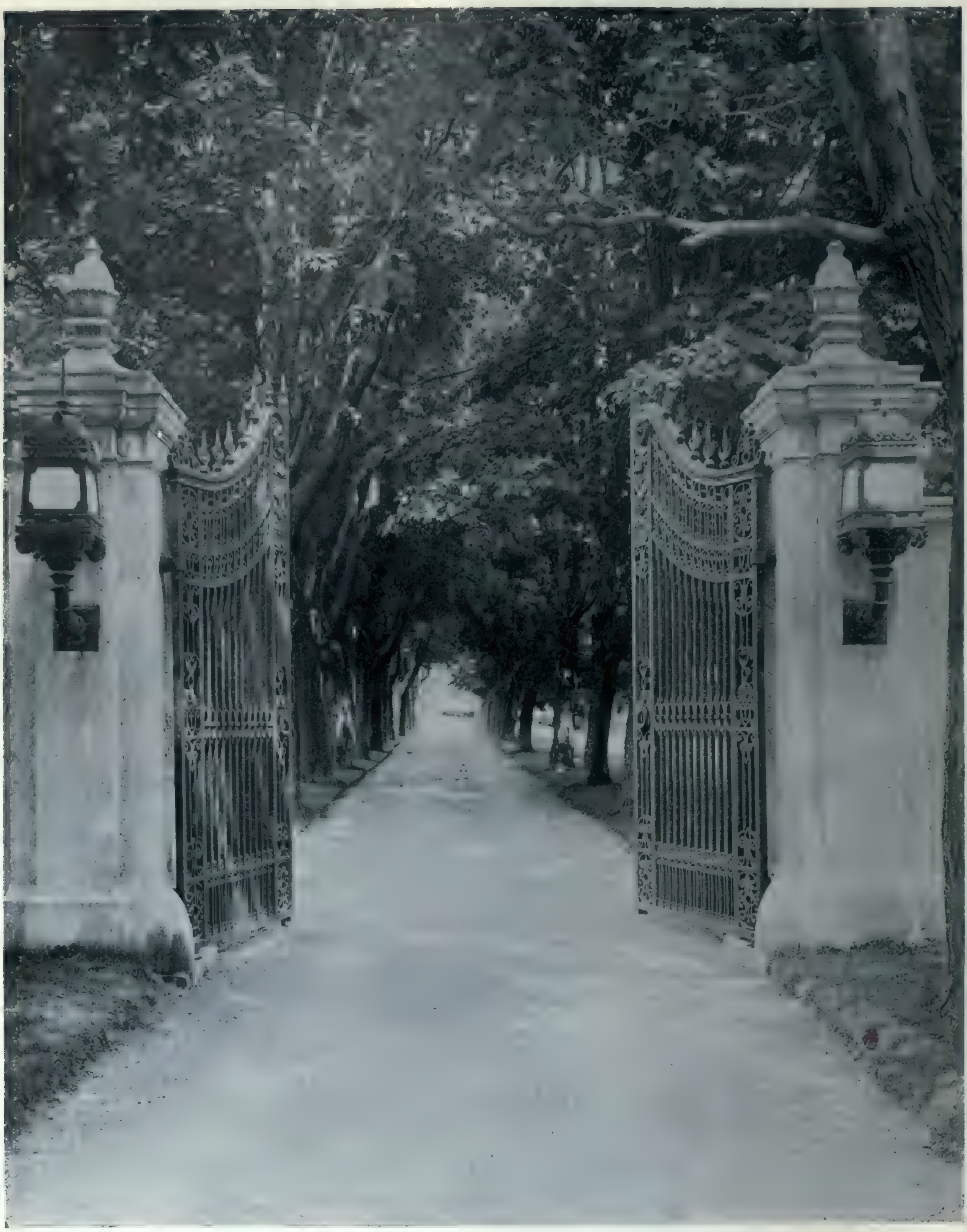


ENTRANCE AT COBOURG, ONTARIO.

AN ARTISTIC DESIGN, WHICH, WITH THE STATELY TREES LINING THE DRIVEWAY, IMMEDIATELY CONVEYS THE THOUGHT OF STRENGTH AND SECLUSION.

New Customs Examining Warehouse, Ottawa

A Six-Storey Fireproof Building, Gothic in Treatment, Harmonizing With Other Fine Structures of the Capital.

THE new Customs Building, Ottawa (illustrated on page 114), has been built from designs prepared by the Department of Public Works, Ottawa.

The building, which is Gothic in treatment, is situated between Sussex street and Mackenzie avenue, with the main frontages to these streets, and extends the entire length of the block between George street and York street, a distance of three hundred and thirty-two feet by a depth of eighty-eight feet, and is six storeys and basement in height, with a central tower comprising two more storeys.

The building throughout is fireproof. The outer walls are faced with stone backed with brick and lined with terra cotta blocks.

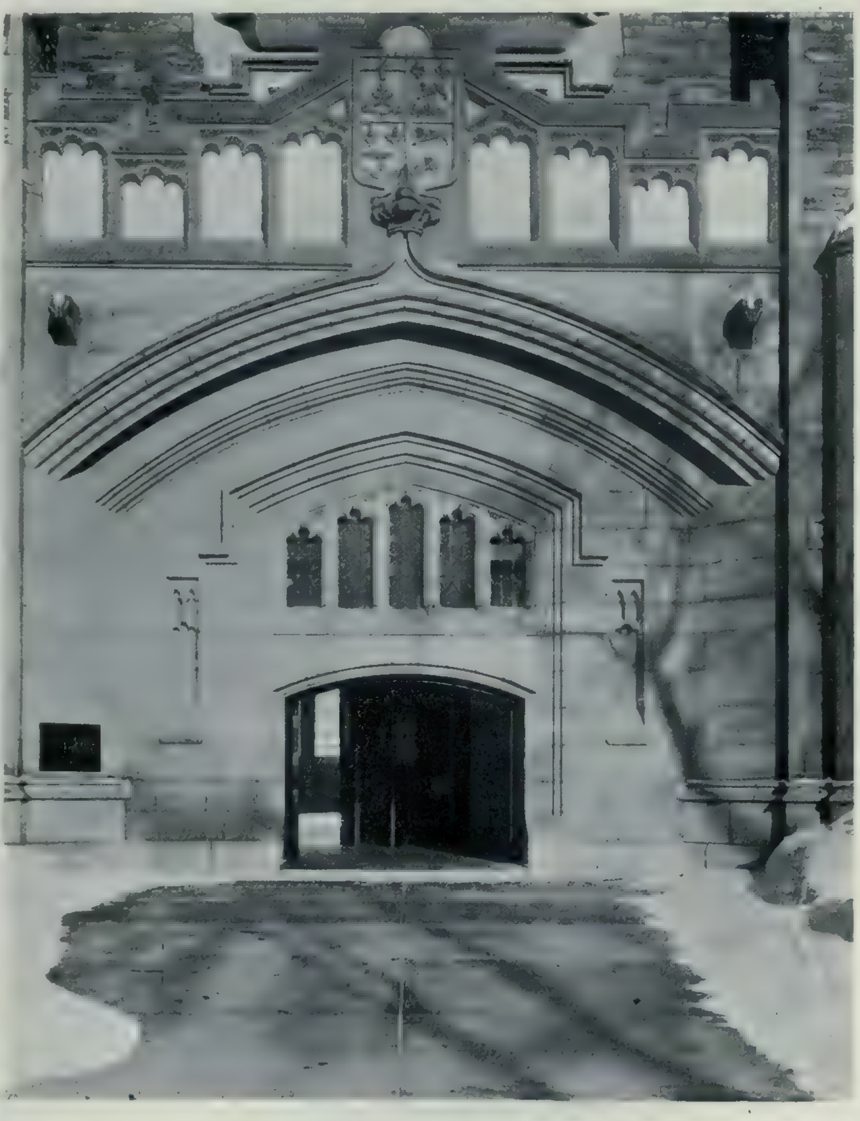
The lower storey next Sussex street and the ends are faced with granite, the remainder being Nepean stone with Wallace stone trimmings.

The floors are of reinforced concrete having a hardwood finish in all offices, with marble and marble mosaic in halls, staircases and corridors.

The partition walls are formed of terra cotta blocks and the ceilings of metal lath finished in plaster.

All halls, corridors and staircases are finished with a marble dado and plaster above.

The three main entrances to the offices are on Mackenzie avenue on the first floor level.



ENTRANCE TO CUSTOMS EXAMINING WAREHOUSE.

The ground floor on the Sussex street level is used as an examining warehouse, the entrances for goods being at the rear of the building reached by a covered driveway under Mackenzie avenue.

The remainder of floors are used for departmental offices.

The interior of the warehouse has been finished with a grey silicate brick.

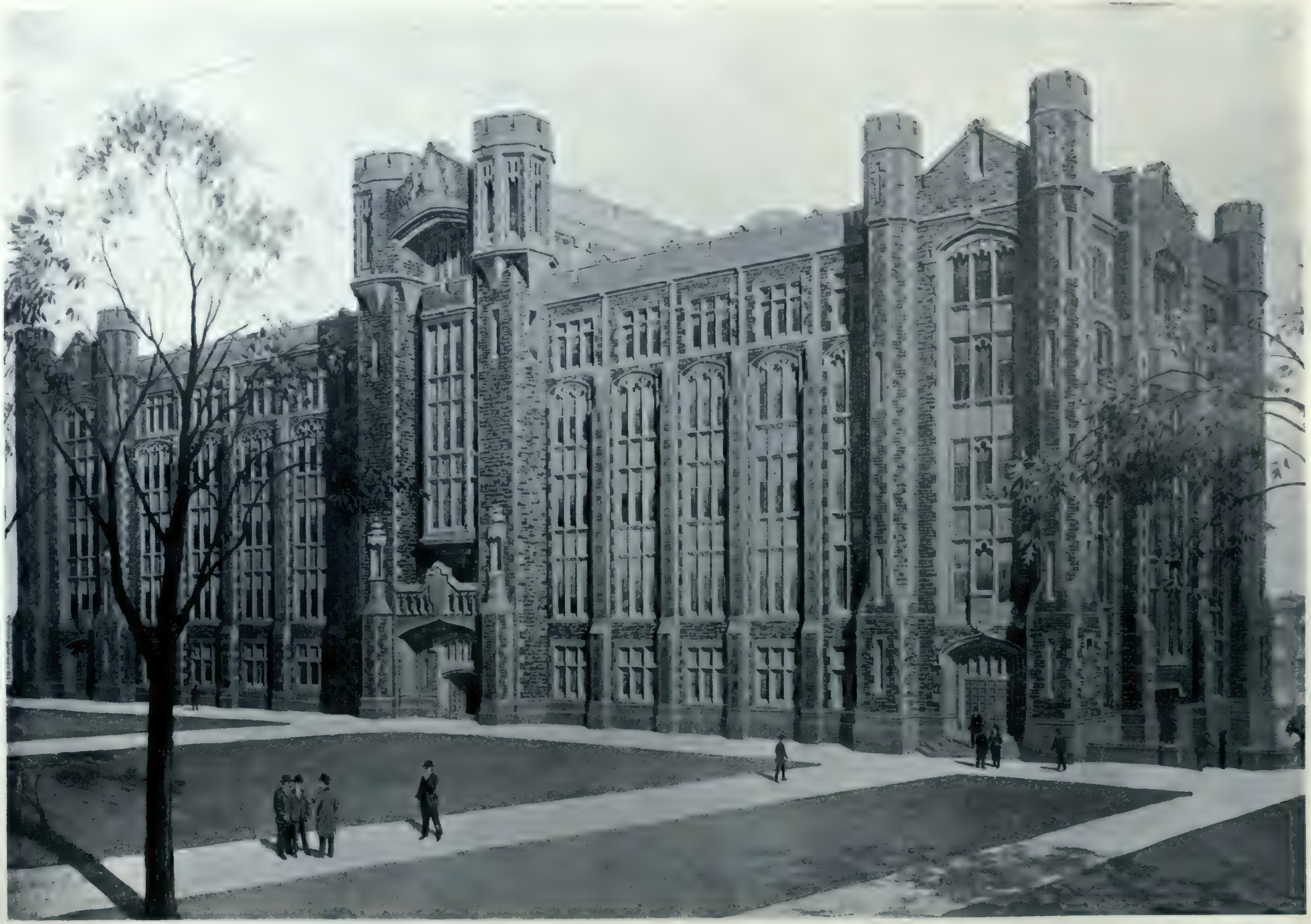
In the main hall facing the central entrance on Mackenzie avenue is a spacious marble and bronze staircase which rises to the top floor. Wide corridors extend on both sides from the central hall giving access to the various offices and which terminate at staircase at both ends.

This is typical of all office floors, making a splendid working and well balanced plan, all rooms and corridors being well lighted.

The building is equipped with three fire hydrants and hose on each floor, and has an up-to-date vacuum cleaning system installed throughout the entire structure.

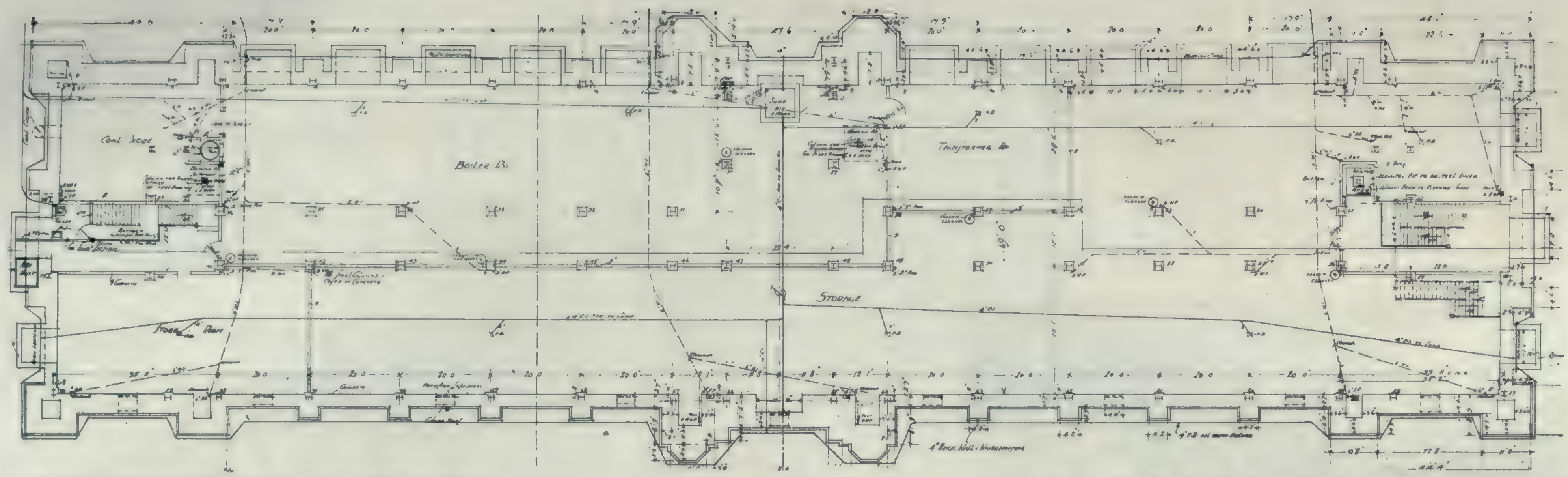
Three passenger elevators are provided for the staff, one in centre and one at each end of building.

The building is heated by a gravity hot water system. The power consists of five return tubular boilers, these supplying live steam to six units of feed water heaters which in turn supply



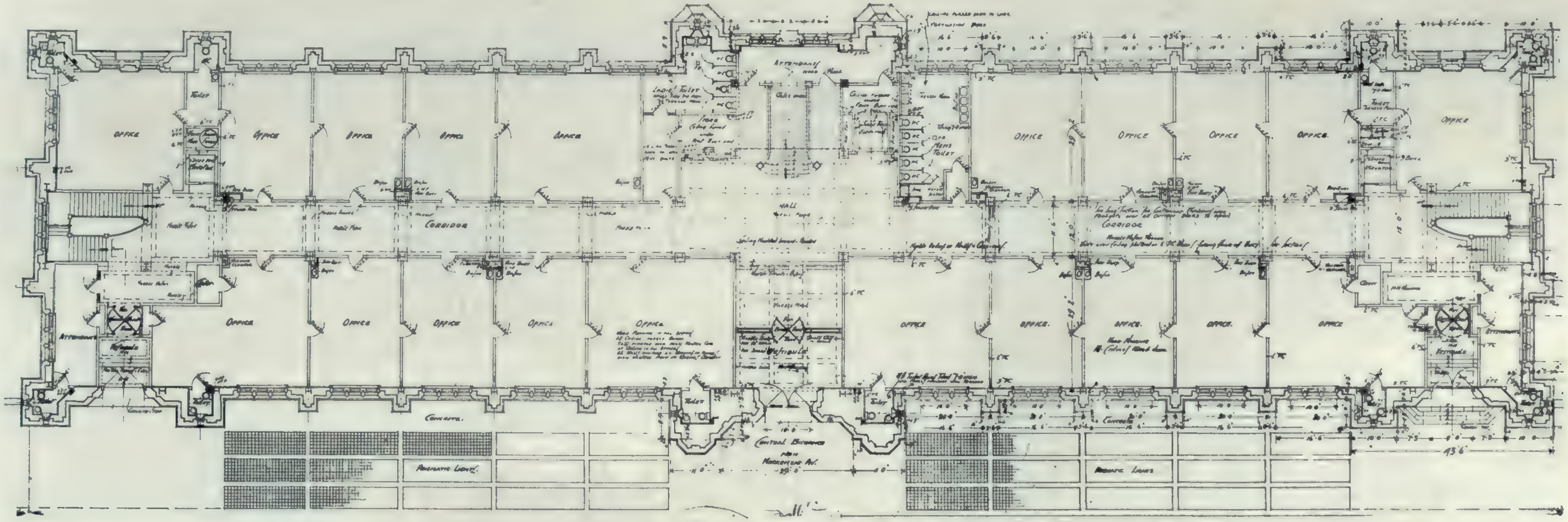
CUSTOMS EXAMINING WAREHOUSE, OTTAWA, ONTARIO.

E. L. HARWOOD, CHIEF ARCHITECT, DEPARTMENT OF PUBLIC WORKS.



BASEMENT PLAN, CUSTOMS EXAMINING WAREHOUSE, OTTAWA.

E. L. HARWOOD, CHIEF ARCHITECT, DEPARTMENT OF PUBLIC WORKS.



FIRST FLOOR PLAN, CUSTOMS EXAMINING WAREHOUSE, OTTAWA.

E. L. HARWOOD, CHIEF ARCHITECT, DEPARTMENT OF PUBLIC WORKS.

MAIN ENTRANCE HALLWAY, CUSTOMS EXAMINING WAREHOUSE, OTTAWA.

hot water to the radiators in the different offices, halls, etc.

A plenum system of ventilation is provided, two fans being installed in tower supplying four changes of fresh air to the offices through concealed ducts above corridor ceiling. The toilets are ventilated through an exhaust fan placed in pent house on roof.

To Mr. E. L. Harwood, chief architect, Public Works, Ottawa, credit is due for this imposing addition to our public buildings.

VIEW OF TYPICAL HALL, CUSTOMS EXAMINING WAREHOUSE, OTTAWA.

Municipal Hospital Accommodation

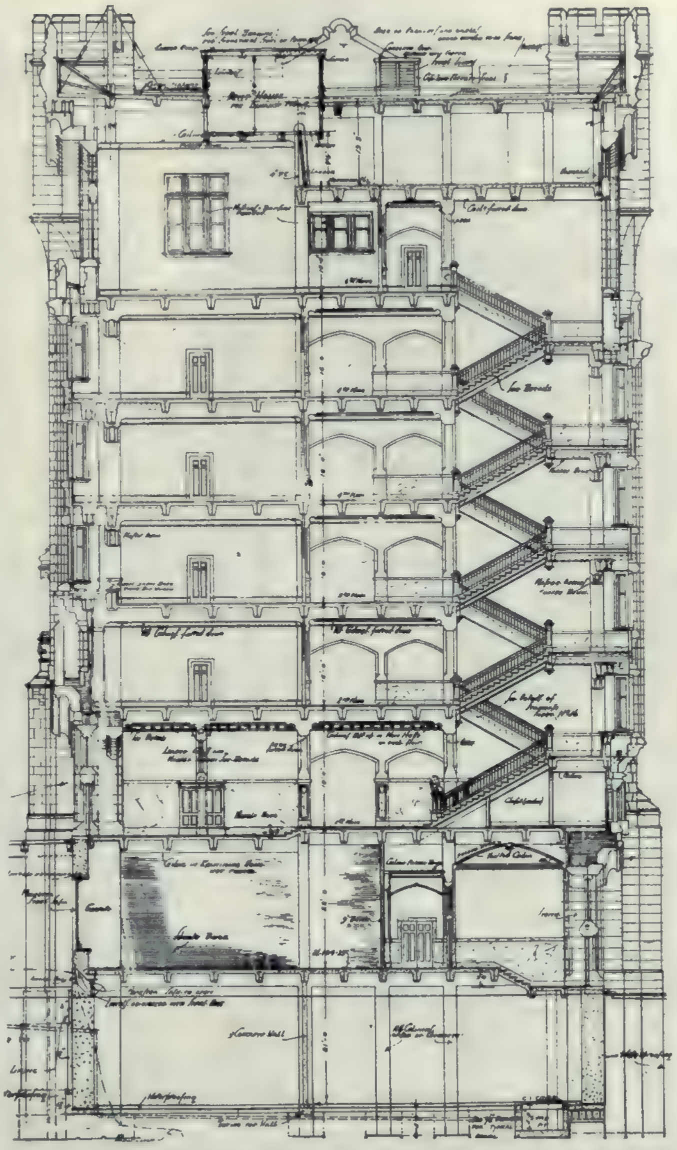
In his letter to the editor, which appears herewith, Mr. Emile E. Delay has aptly drawn attention to facts which have a pertinent bearing upon this important subject. The Provinces of Alberta and Saskatchewan have already enacted legislation empowering municipalities to provide hospital accommodation, and on account of the interest shown by the public, we reproduce the explanation of the subject as published by the Saskatchewan Bureau of Public Health in the "Public Service Monthly":

"To provide adequate and efficient hospital accommodation, especially in rural districts, has been a problem which has been growing more and more acute, and how best to supply the need in the most effectual and simple way has exercised the thought of the officials of the bureau for a considerable time.

"The enacting of the present Act, therefore, is the result, and it is hoped that by making the adoption of it simple and easy, no difficulty may arise to prevent any limited number of municipalities uniting for the purpose of having in their midst a hospital suitable, ample and comfortable for the needs of a defined area.

"Any two or more contiguous or adjoining municipalities may co-operate for the establishing of a hospital, and the process is made so plain that ratepayers should have no difficulty in understanding their position.

"The procedure is, that wherever two or more (preferably more) municipalities consider that a hospital is required and desirable in their district, the councils meditating the establishing of such an institution should pass resolutions to that effect and then arrange for a meeting of representatives



SECTION THROUGH CENTRAL TOWER, CUSTOMS EXAMINING WAREHOUSE.

from each council intending to join in the scheme, for the purpose of signing an agreement to unite.

"When this is accomplished, the various councils will then prepare a by-law for submission to the electors for their approval to establish a union hospital in accordance with the provisions of The Hospital Act. Fifteen (15) days' notice is required before the poll can be taken.

"When the by-laws have been passed the agreement becomes operative and the councils then appoint one of their own number and one ratepayer—not a councillor—as representatives of the union hospital board.

"The appointed representatives of the several councils will then meet as the hospital board, elect a chairman and vice chairman, and appoint and employ a secretary-treasurer at such remuneration as may be decided upon.

"The board shall then, upon organization, prepare a scheme providing for a site and building suitable for the district, together with the necessary equipment, furniture, etc., giving an estimate of the amount required for capital expenditure. This estimate shall be submitted to the Local Government Board for its approval and decision on the sums to be raised, when the councils of the various municipalities may pass the necessary by-laws for providing the sums required.

VIEW OF BOILER-ROOM, CUSTOMS EXAMINING WAREHOUSE, OTTAWA.

"Let it be clearly understood that the union hospitals are to be for the accommodation, care and treatment of residents in the districts uniting, and that a medical certificate for admission must be obtained, or a certificate from the secretary-treasurer with the consent of his council, emergency cases excepted.

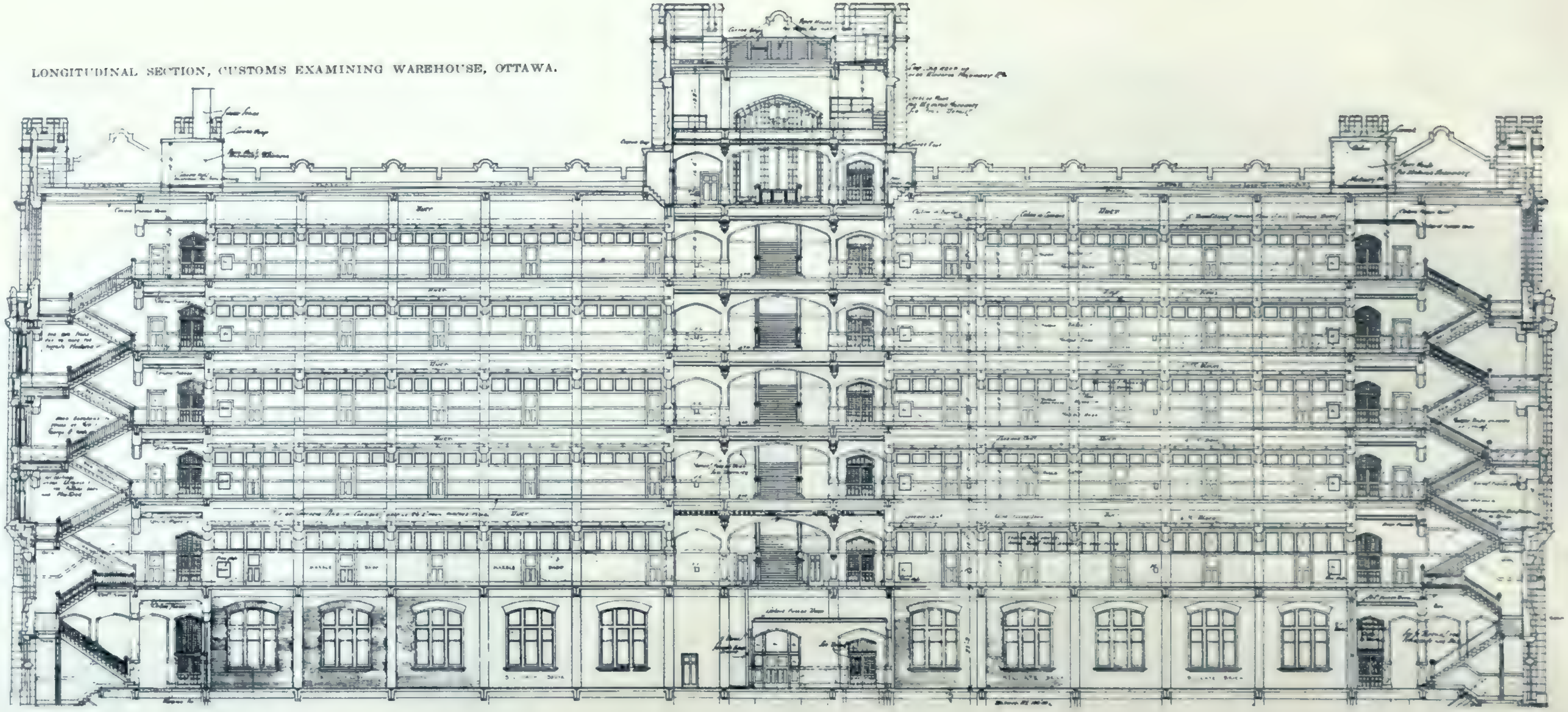
"The whole scheme is one of self-help, similar to that for insurance, the municipality taxing the whole for the benefit of the whole. It is no charity or pauperizing scheme, but a self-protecting one, and one managed and controlled for the benefit of all unfortunate enough to require such service. The hospital is the birthright of all residents and is free to all, the fees for which will be paid by the municipality from which the patients are sent."

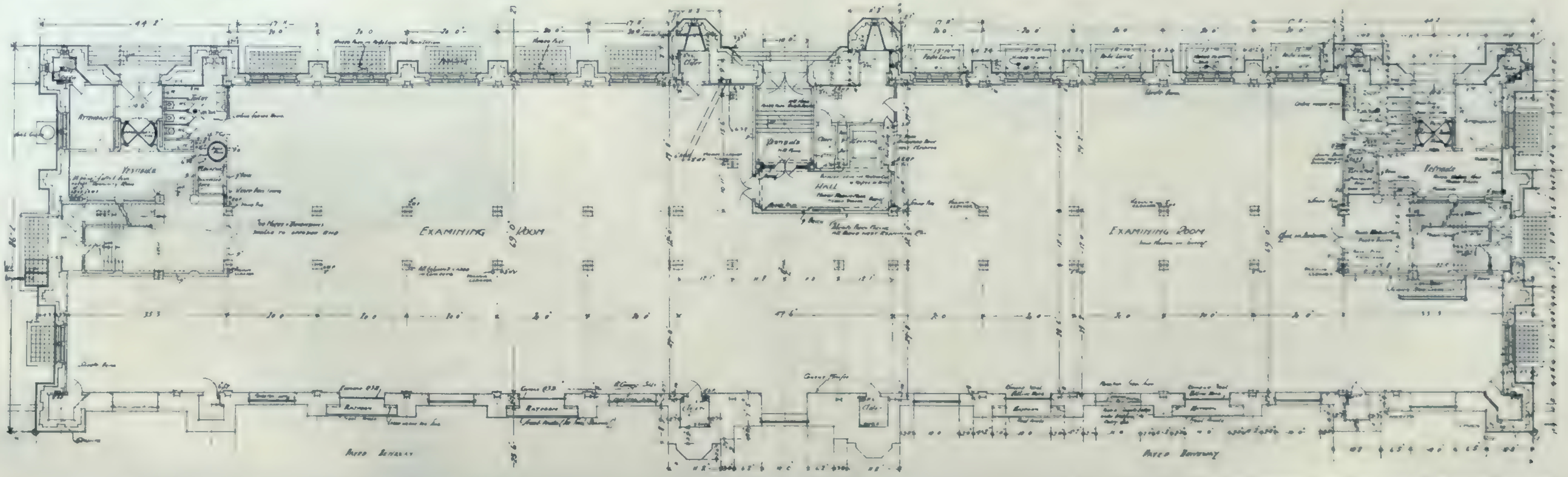
Editor of CONSTRUCTION:

Dear Sir,—I have read with much interest the article in the December, 1916, issue of the "Public Service Monthly," published by the Government of Saskatchewan, pages 82 and 83, re Municipal Hospitals, proposing that one or many municipalities should join together to build hospitals.

These ideas have certainly a very generous object, and one which the public will un-

LONGITUDINAL SECTION, CUSTOMS EXAMINING WAREHOUSE, OTTAWA.





GROUND FLOOR PLAN, CUSTOMS EXAMINING WAREHOUSE, OTTAWA.

E. L. HARWOOD, CHIEF ARCHITECT, DEPARTMENT OF PUBLIC WORKS.

doubtedly applaud, but without prejudicing this important question which in the "Public Service Monthly" is dealt with only from the commercial point of view, it seems to me indispensable to point out that the organization of these hospitals should be promoted only by representatives elected by the municipalities interested in collaboration with persons *qualified* both from the medical point of view and from the technical, as the question of the details of construction of a hospital should be decided only by persons capable of advancing ideas based on a special study of this subject in order to avoid, at the very commencement of the undertaking, costly errors due to the lack of technical knowledge which subsequently are almost always irreparable.

It is possible that some persons may claim that they have technical knowledge which they do not possess, and if an efficient hospital could be built by enthusiasm, speech, good-will, or by reason of their own public standing, their efforts certainly would be beyond praise.

We, however, cannot build hospitals on these good wishes alone.

A hospital is a building that needs a varied and extensive knowledge in selecting the site, having due regard to water planning, salubrity, orientation and general sanitation before considering the details of the inside organization.

The size of the building depends largely upon the number of beds required for the sick, also the kind of sickness which would be treated there, and the accommodation required for the patients and the staff.

We must also consider the amount of money which the inhabitants of the municipality or municipalities are able and willing to provide.

There is the extent of the duties of the Commission elected who will be authorized to consult with qualified persons such as doctors and architects, who know the kind of building they can build in these circumstances, and who may be relied upon to avoid the errors which otherwise would incur extra and useless expense by inside arrangements defective and prejudicial to the patients.

The preparation of the plans necessary for a hospital requires on the part of the architect extended knowledge of hygiene, heating, ventilation, accommodation required for the different departments, facilities of communication, orientation of the several departments, and their best location as regards normal lighting, entrances, approaches, staircases, elevators, corridors, wards for infectious diseases, rooms for operations, sterilization, disinfection, baths, lavatories, kitchens, easy distribution of food, diet kitchens, provision stores, laundry and drying rooms, morgue, administration office with vault for books and valuables, consulting rooms, drug store, rooms for maternity cases with artificial incubators and baths; rooms for tuberculous patients, protected veranda with plenty of sunlight for sickness and recovery; garage for motor cars and ambulances, wheel chairs, accommodation for the permanent staff, orderlies, nurses, kitchen maids, porter, steam engineer, gardener, laundresses, linen closets, electrical machinery, soft water, warm and cold water, distributed automatically with pressure wherever desired, common water for the kitchen, W.C., fire hose, water for cleaning with, etc., hot water heating for small hospitals, and steam heating for large hospitals; chapel, refectories, garden for recreation, and kitchen gardens.

Above all, every service should be as complete as possible for giving the best efficiency, which is absolutely necessary in a modern hospital.

To arrive at this result, it is indispensable to have an architect who is really an architect, cooperating with a doctor who possesses the professional aptitude and recognized technical qualifications.

It is only by fulfilling these conditions that it is possible to arrive at a good result, and in writing this letter, I have in view only the good of the country where everybody and anybody must help to the best of his ability. In conclusion, I beg you to give this writing publication, for which I thank you in advance.

Yours faithfully,

EMILE E. DELAY,
Architect, E.D.P.,
Diplome per le Gouvernement Francais,
Regina, Sask.

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Completion of Ten Storey Office Building at Calgary, Alberta

The Lancaster Building, Calgary, a ten-story office building, the steel frame and concrete floors of which were erected in 1913, is now to be finished as to the exterior and partly finished as to the interior at a cost of approximately $100,000. The building will be mainly of brick, the greater part of which, as well as the hollow tile to be used for backing in a part of the structure, will be of local manufacture. About fifty thousand facing bricks and two hundred tons of terra cotta will be imported from the United States, as will also probably about one thousand square feet of ceramic tiles. The plumbing fixtures and piping will also be of American manufacture, and the electric-lighting fixtures, panel boards, etc., builders' hardware, such as locks, hinges, etc., and some paints, are likely to be purchased in the United States.

The contracts for plumbing, heating, and electric-wiring installations have been awarded to Calgary firms. The elevators will be furnished by a Toronto firm.—U.S. Commerce Reports.

C.P.R. Station, North Toronto, Toronto, Ont.

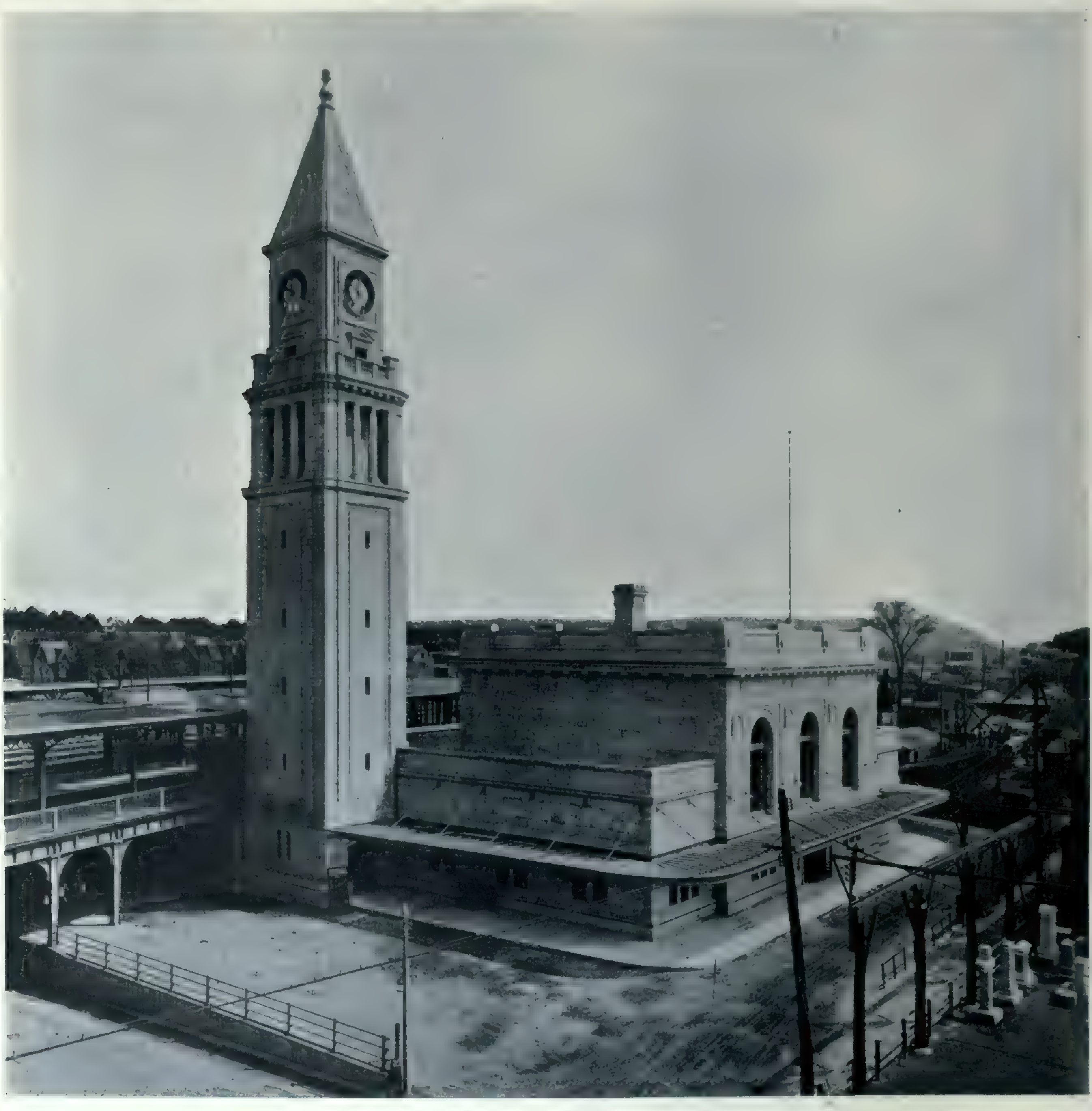
Attractive and Efficient Design, Well Worthy Of the City to Which It Is An Entrance.

CERTAINLY the travelling public should be grateful to the railway that has provided this modern and handsome stone structure, and which offers every accommodation.

The style of architecture is well suited to the character of the surroundings, and is well worthy of the city to which it is an entrance. Location of main entrances and exits are so established as to facilitate the handling of passengers, and the areas available for baggage, mail and express have been so designed as to meet all demands that should be placed upon them.

Durability, an essential in passenger station design, has not been sacrificed, and from the material and equipment used, this station should prove satisfactory for a long time to come.

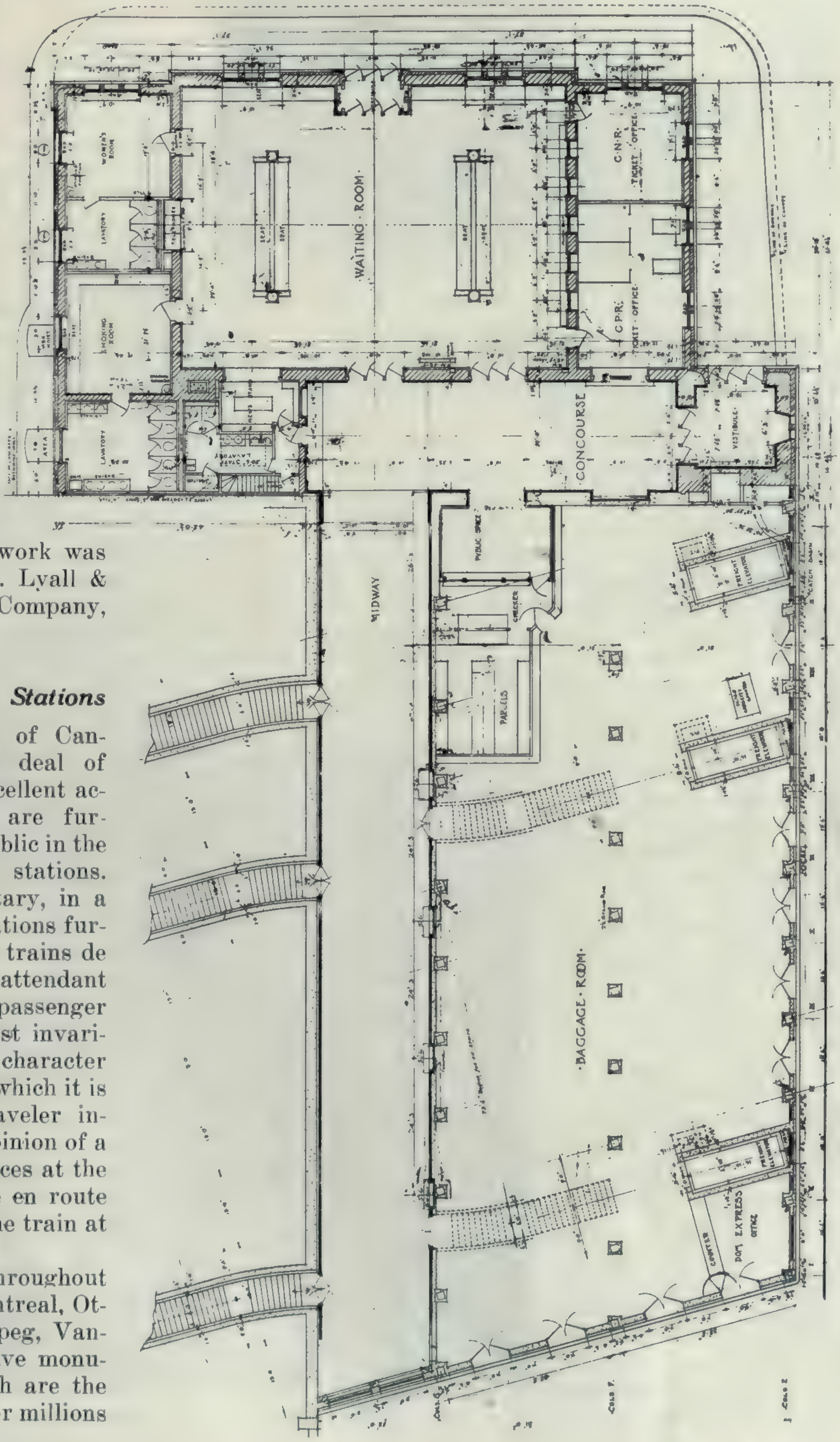
Canopies adjacent to and over the platforms provide a covered way to and from trains, and will add to the comfort of the traveller in his use of the station. The south and west side of the station have metal canopies extending over the sidewalks. A driveway twenty-eight feet wide along the Yonge street side gives easy access to baggage room, waiting room, and ticket office.



C. P. R. STATION, NORTH TORONTO, TORONTO, ONTARIO. DARLING & PEARSON, ARCHITECTS.

A subway under the six tracks provides for the continuation of Yonge street. The tracks pass over the baggage room section of the station, and the difference in level between the station floor and the tracks is but fourteen feet. Three staircases leading up to the platform are lined with white enameled brick. The main concourse, tower entrance, and waiting room have been walled with marble over the entire height. Both the direct and indirect methods of lighting have been used, producing a uniform and restful effect.

The station building is one hundred and fourteen by seventy-five feet, and the tower, an imposing view of which is obtained from the surrounding district, is one hundred and forty feet high and is surmounted by a terra cotta spire. Darling & Pearson were the architects, and the construction work was carried through by P. Lyall & Sons Construction Company, Limited.



C. P. R. STATION, NORTH TORONTO, TORONTO, ONTARIO. DARLING & PEARSON, ARCHITECTS.

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Railway Passenger Stations

Railroad companies of Canada deserve a great deal of credit for the most excellent accommodations which are furnished the traveling public in the way of passenger stations. These are supplementary, in a way, to the accommodations furnished in the shape of trains de luxe, with all their attendant luxuries. The modern passenger station to-day is almost invariably an index to the character and size of the city in which it is situated, and the traveler instinctively forms an opinion of a city when he first glances at the railroad station, while en route or upon stepping off the train at his destination.

The large cities throughout Canada, including Montreal, Ottawa, Toronto, Winnipeg, Vancouver and others, have monumental buildings which are the gateways to the city, for millions of travelers. These buildings, from the standpoint of design and construction, compare favorably with any of the public buildings erected by the Provincial or municipal Governments. For these buildings, and the conveniences and accommodations which they offer, the traveling public should be grateful to the railroads. The more important terminals in the larger cities have been illustrated from time to time in our

GENERAL WAITING ROOM, C. P. R. STATION, NORTH TORONTO, TORONTO, ONTARIO.

architectural periodicals, and form an interesting study, both from the standpoint of the architect and engineer, as well as from the standpoint of the railroad operating official.

In these large terminals, the first problem to be solved is the question of trackage to the site of the building. This may involve the rearrangement or purchase of miles of right-of-way. The number of trains are estimated for the present and the future, and the number of tracks determined. Grades are established. Location of main entrances and exits established, areas available are assigned for handling of passengers, baggage, mail and express, and other problems of operation, such as train movements, storage of cars, handling of mail and express cars, coach yards, are determined. These are some of the phases of the operating department's problem.

After obtaining all data from the operating department relative to train movements, trackage, etc., the architect should determine from the inspection of the site, the character of the surroundings, including buildings, in order to intelligently treat the subject from an architectural standpoint. Too often the character of the surroundings is not taken into account—and the building of perfect design is incongruous in its setting. The style of architecture which is appropriate for a station in the charming park of a little city in the mountains, or amid the tropical foliage of the South, would be out of place in the wholesale or manufacturing district of some of our Canadian cities.

The railroad station must be worthy of the city to which it is an entrance. Its two principal elevations deserve, at least, equal treatment; the track side which the incoming passenger first notices when he steps from the train—and the town side, which frequently offer more important opportunities for distinguished treatment. The writer knows of plans which were prepared for a station building, for a city of perhaps 100,000 inhabitants, facing upon the city square, in which were some important public buildings. The architect had quite overlooked the fact that the station had any other front than the track front, and what was called the rear of the building—in reality its most important elevation, was designed of common brick, and without any architectural treatment. This necessitated a re-design of the building.

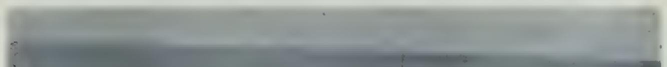
The object of the passenger station being to accommodate the maximum amount of business of various kinds which pass through its doors, all of these streams of travel must be routed in the shortest direct lines, without crossing or recrossing. The architect must know the direction and volume of pedestrian, teaming, carriage, mail and express traffic. Also the facilities required for handling street cars, elevated

CONCOURSE, C. P. R. STATION, NORTH TORONTO, TORONTO, ONTARIO.

roads, subways, etc. For instance, if the passengers arrive at the station from a given direction, care must be used that cabs, mail and express wagons do not cross the path of passenger traffic, and a step further in this line of reasoning would indicate that mail, baggage and express rooms should be located so that passengers do not have to pass them on their journey from the street through the station to the train.

VIEW OF PLATFORM AND CANOPIES.

When all the facilities are provided for, as required by the character and volume of the business handled, and their inter-relation established in such a way that the above mentioned results are obtained, the next essential which every architect will appreciate, is to determine the proper size of the rooms, and, therefore, of the building. We have all gone through the painful process of providing for the ideal arrangement of facilities for a client, and been obliged to eliminate and reduce, and in a great many cases, it must be confessed, the architect is not entirely blameless. The same principle holds as true for a passenger station as for a residence or a hotel. The building which is too large is just as unsatisfactory as one which is too small, and a careful study of existing conditions will frequently result in modification of layouts, resulting in a building of maximum efficiency at minimum cost. This is fair to our clients—the railroad companies—who are as adverse to expenditure of money unnecessarily as is the man who is building a building for investment, and perhaps more so, because the direct returns of the enormous capital invested by the railroads in station buildings is without direct financial return or profit.



ENTRANCE FROM WAITING ROOM TO CONCOURSE.

Durability is an essential in the design of a passenger station, because of the extremely hard service which every part of the building and its equipment receives. The sheet metal work must be better than the ordinary galvanized iron, because of the corrosive action of cinders which collect and form acid. Walls and roofs should be of a non-absorbent material to prevent discoloration by locomotive smoke. Interior trim and finish of waiting rooms must be of material and color which cannot be defaced. Seats or benches must be of quality to conform to the character of the building, without extremely high cost; standard patterns of benches can be obtained. Floors must be extremely durable, and easily cleaned. Doors must be of sufficient weight to prevent damage due to constant and rough usage. Ticket offices must be provided with wall space for ticket racks. Suitable grills, with counters and money drawers, for ticket selling. Operator's benches. Provision for semaphore operation. An unobstructed view of the track in all directions. Grills at windows to prevent robbery of agents. Space for storage of tariff file. Convenient arrangement of ticket windows, opening upon various waiting-rooms. It is a comparatively simple matter to provide one or two ticket windows for men and women's waiting-rooms.

The baggage, mail and express rooms present their problems; adequate and satisfactory scales must be provided, and suitably located. Storage platforms, check racks, and other facilities are required, always remembering the necessity for doors of adequate size, properly protected with jam guards. Baggage trucks, if not kept away from the building, will deface any structure, and curbs must be provided on any platform used by trucks. The floor level in baggage and express rooms, and its relation to the driveways and platforms, deserves consideration to facilitate handling of baggage, etc.

Canopies adjacent to the platforms providing a covered way to and from trains, are features which add a great deal to the comfort of the traveler in his use of the station. The operating official objects to the use of canopies adjacent to the tracks, and there are various laws which are specific in the clearances permitted. The use of the canopy usually detracts from the architectural beauty of the building proper.

Regardless of these objections, however, their use is becoming more general, and is appreciated by the traveling public.

The railroads are to be congratulated on realizing the importance of employing competent architects to design their passenger stations, as well as their other structures which deserve artistic treatment, and the architect should be glad of the opportunity of studying the special problem diligently, to the end that station buildings so designed may be a credit, not only to the railroad and to the city, but to the architect.

Coal Production in Canada in 1916

The Dominion Department of Mines has received from the principal coal operators in Canada, returns of their production for ten months supplemented in most cases with estimates for November and December.

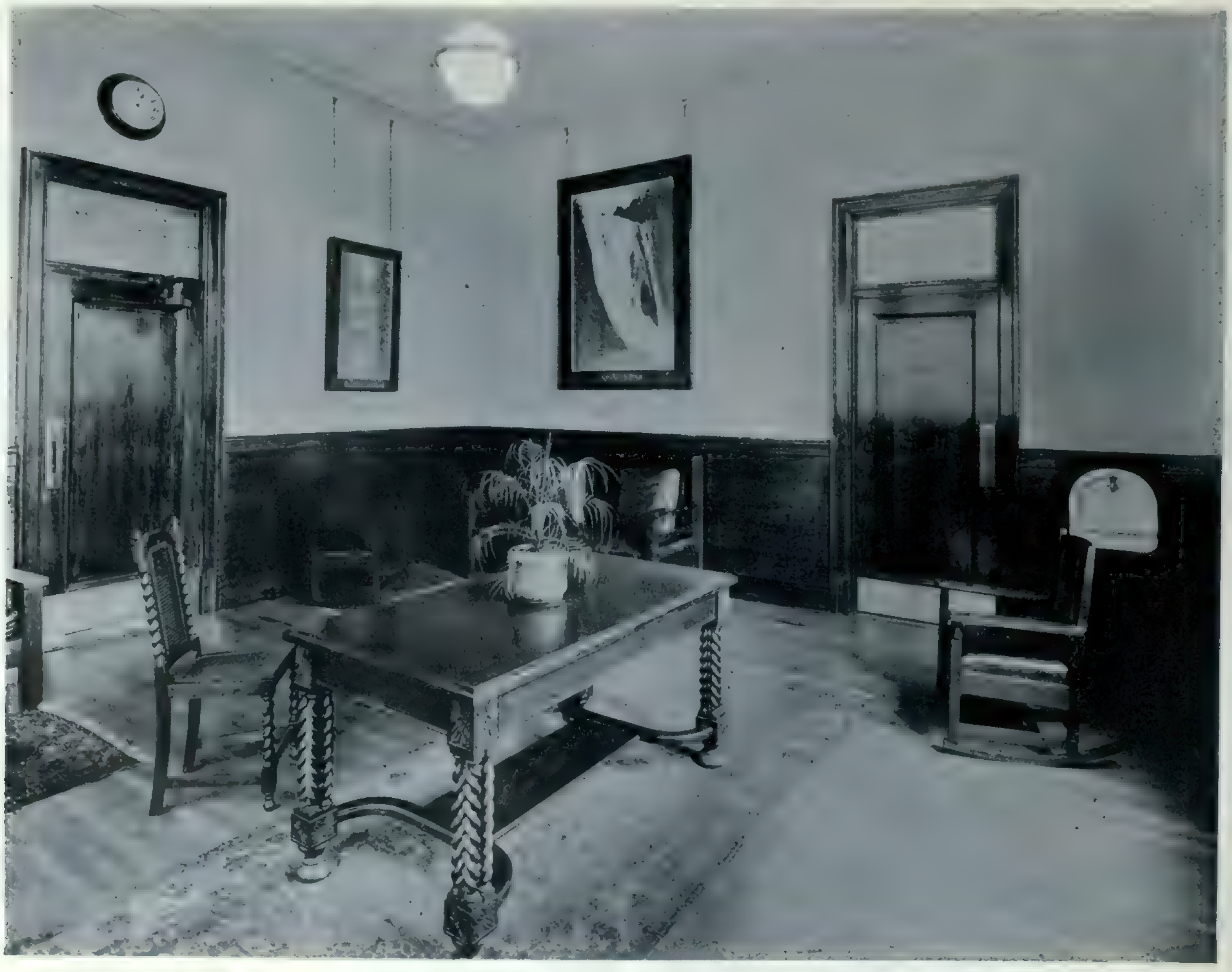
On the basis of the record available, it is estimated that the total production of coal in Canada during the calendar year 1916 will approximate 14,365,000 short tons (equivalent to 12,825,892 gross tons). The estimate is believed to be fairly close for Nova Scotia and British Columbia. In Alberta, however, there are so many small operators that final returns may show a wider variation from the estimates now made.

By Provinces, the estimate is as follows, the figures for 1915 being included for comparison.

Estimated coal production in Canada, 1916—in short tons:

	Production of Coal. 1915.	1916.	Increase or Decrease.
Nova Scotia	7,463,370	6,950,000	513,370
New Brunswick	127,391	135,000	7,609
Saskatchewan	240,107	260,000	19,893
Alberta	3,360,818	4,400,000	1,039,182
British Columbia	2,065,613	2,620,000	554,387
Yukon	9,724	....	....
Total	13,267,023	14,365,000	1,097,977

The 1916 production exceeded that of the two previous years, the increase over 1915 being about 8 per cent.



VIEW OF LADIES' WAITING ROOM, C. P. R. STATION, NORTH TORONTO, TORONTO, ONTARIO. DARLING & PEARSON, ARCHITECTS.

The Whalen Building, Port Arthur, Ontario

A Modern Office Building in the Centre of Port Arthur's Business District.

HAVING eight storeys and basement, built of reinforced concrete, sitting on a solid rock foundation, the building covers an area of one hundred by ninety-two feet, and there are one hundred and twelve offices in the building above the ground floor. The construction is modern and fireproof.

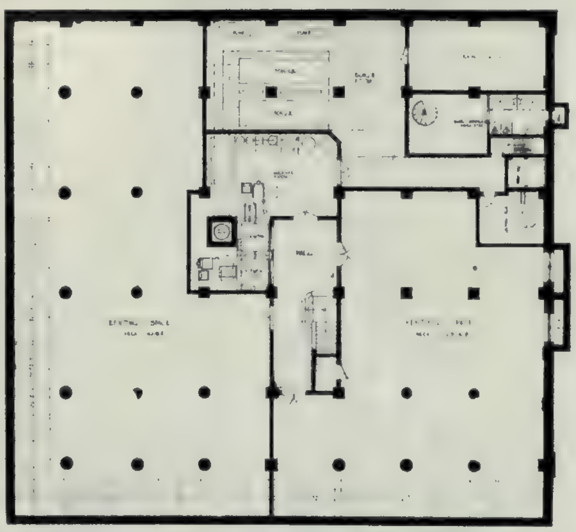
The building has a height of one hundred and ten feet above the sidewalk level, and is the outstanding landmark of the two cities. The building as a whole has been designed with an eye solely to solid business simplicity, a maximum of outside light and service, and the avoidance of using rentable space for ornamental effects. The exterior is of a light grey semi-glazed terra cotta, with trimmings of a light cream, with the base of Vermont granite. The window spandrels and mullions are of ornamental design, and constructed of cast-iron in copper green color, giving a beautiful finish to the exterior. The building as originally designed by the architects was to be of brick, and the decision to change to terra cotta was made by the owners when it was too late for the architects to amend their design to suit the change of material.

The main entrance corridor has a terrazzo floor, the partition walls are built of hollow terra cotta tile, and the base is of marble, while the ceiling is an artistic plaster design.

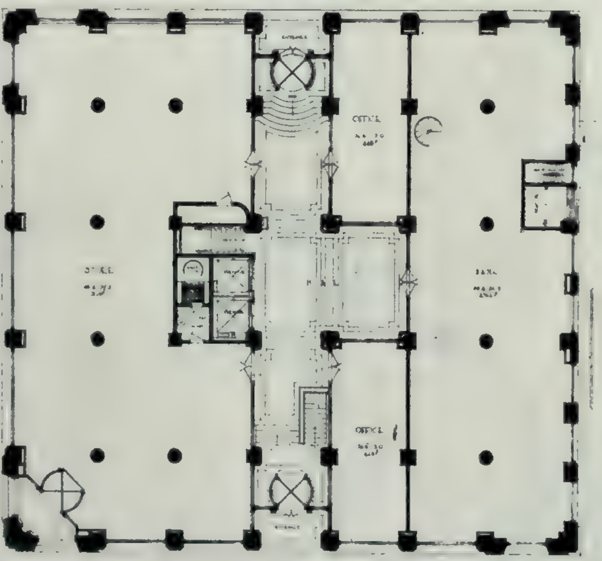
Three elevators are installed. Two high-speed passenger elevators, and the third a freight elevator.

The interior trim is of Honduras mahogany, the doors being inlaid with satin and orange wood. The corridors above the first floor have terrazzo floors, marble base and wainscoting. On each of the upper floors are two large fireproof steel vaults, containing twenty steel nests, and equipped with combination locks. All the sash are glazed with polished plate glass.

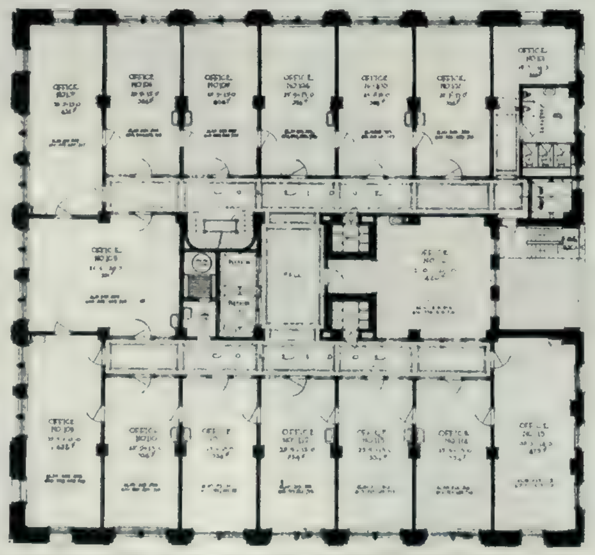
The building is heated by steam, and is thoroughly equipped with fire fighting apparatus. The architects for the building were David L. Brown and Hugh Vallance, Montreal, Que.



BASEMENT PLAN, WHALEN BUILDING, PORT ARTHUR, ONT.



GROUND FLOOR PLAN, WHALEN BUILDING, PORT ARTHUR, ONT.



TYPICAL FLOOR PLAN, WHALEN BUILDING, PORT ARTHUR, ONT.

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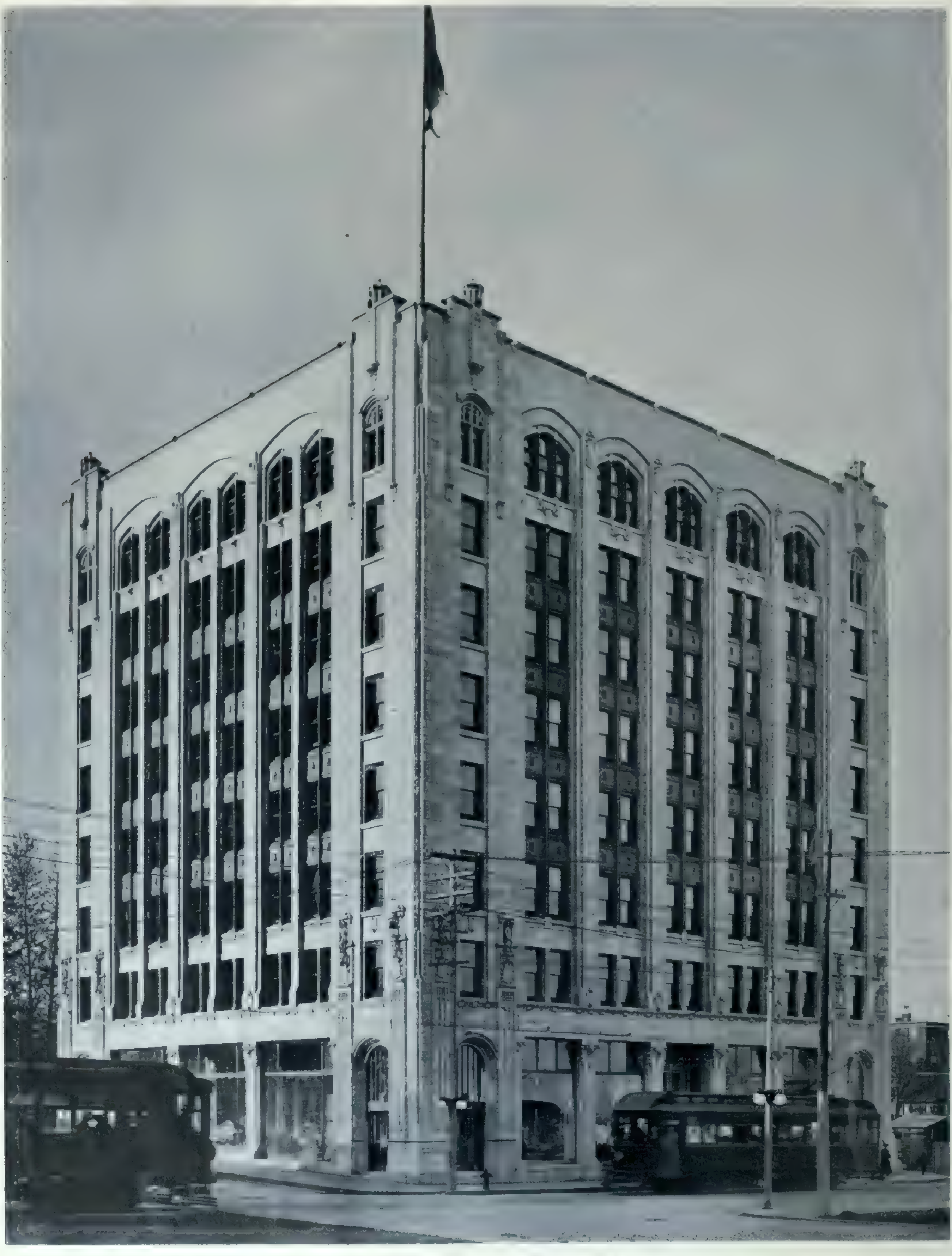
The Increased Cost of Building

One of the most difficult questions which the architect is now called upon by clients to answer is in regard to the probability of a continuation of present prices of building materials and labor. Projects involving the construction of buildings are being delayed or held in abeyance on every hand by reason of the fact that estimates based upon prices current some months ago are in all cases being exceeded when actual tenders are submitted by builders. The client might naturally inquire of his architect whether there is prospect of a reduction in price within the next few months, and from information received we find that there exists a considerable difference of opinion on this subject. In one instance a State architect has recently advised the holding in abeyance of all construction except that considered absolutely necessary to provide accommodations for increased population in State institutions. In another, we find an architect advising his clients that there is little likelihood of a material reduction in prices for some years to come. We are inclined to agree with the latter view. While, undoubtedly, the cost of construction work is abnormally high in comparison with prices which obtained to within a year of the present time, it seems doubtful whether any reductions which can be reasonably expected within two or three years will compensate for the delay in securing needed buildings of any character,—"American Architect."



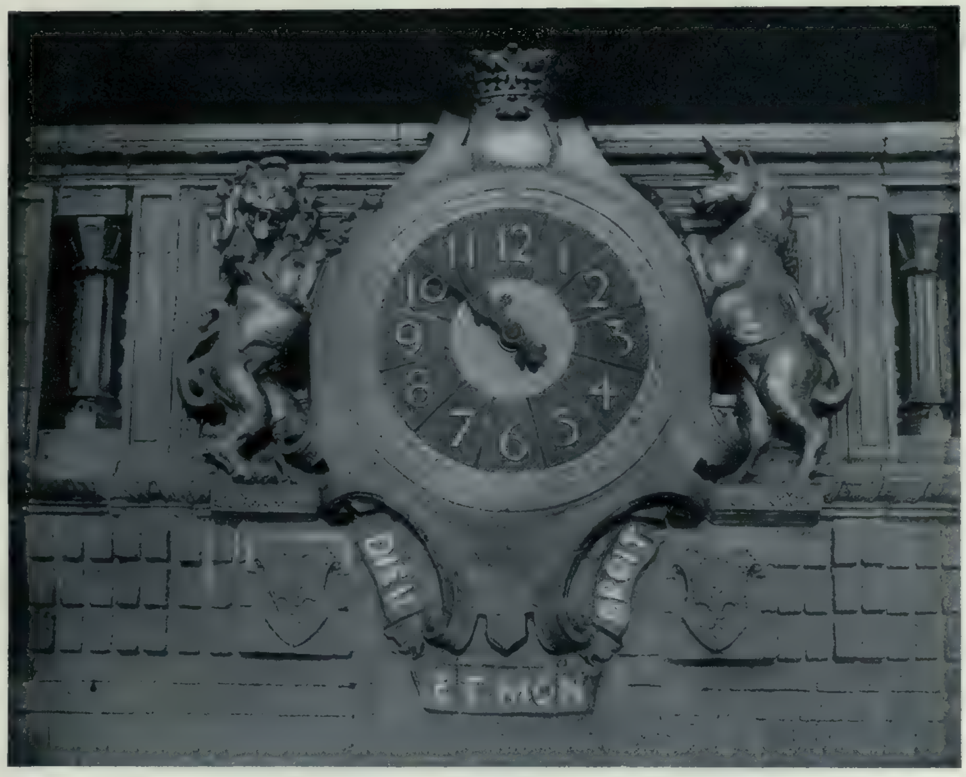
WHALEN BUILDING, PORT ARTHUR, ONTARIO. DAVID L. BROWN & HUGH VALLANCE, ARCHITECTS, MONTREAL, QUEBEC.

Interesting Application of Faience Decoration

A New Decorative Interior Effect of Pleasing Appearance Used on C.P.R. Station, Quebec.

THE passenger station of the Canadian Pacific Railway Company of Quebec contains a feature which may deserve special consideration from an artistic and architectural, as well as a practical technical standpoint.

The principal decorative effect of the interior has been obtained by the introduction of Faience tiling applied in a somewhat novel manner. When we call it "tiling" we strain the point to some extent, as much of the work should rather belong to the class of terra cotta. The architect, however, tried to combine the soft colors of Faience with the architectural forms, especially as the Faience enamels have a very interesting texture, which cannot be realized in the so-called polychrome terra cotta, for practical reasons.



DETAILED VIEW OF CLOCK-FACE. THE ENTIRE FACING IS MADE OF FAIENCE.

To explain this point in a general way we state that terra cotta is burned in one firing which will only allow a very thin coating of enamel, which, to give the desired color effect must be opaque, while Faience is covered in a second burning with a very heavy enamel, which is semi-transparent, and retains a certain translucency for the surface. Accidental shadings and separations of coloring add furthermore to the artistic effect of Faience.

The limitations, however, in Faience consist of the impossibility to manufacture it in the same large sizes or pieces as terra cotta, and it was therefore necessary to construct the various members in many pieces, which were manufactured and burned separately, and assembled at the building. Some of the larger decorative pieces—the cartouches, brackets, clock faces, etc., were modeled in the original form and afterwards cut into convenient sections. While the final effect was, of course, a matter of speculation, the result was entirely gratifying, as the mosaic character of the work, showing many jointings, is thoroughly in harmony with the texture of the walls of the interior, which consist throughout of so-called "tapestry brick."

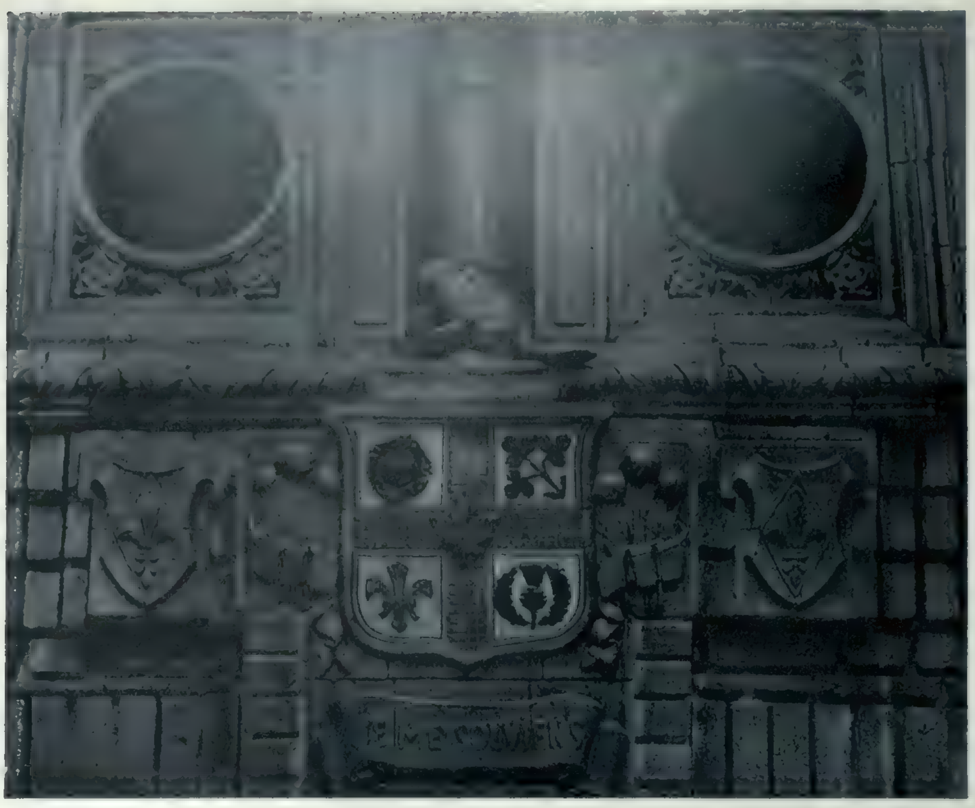
The large wall space of the concourse was furthermore decorated with innumerable Faience inserts in contrasting colors, which produces a very interesting texture.

The general tone of the Faience is a light, creamy buff. Cartouches and more decorative members are treated in polychrome and gold. The motives employed consist of English, French and Canadian emblems and escutcheons, and smaller illustrative details show symbols of transportation, agriculture, fisheries, etc. A very interesting feature is a well-conceived martial beaver surmounting a symbolic Canadian Coat-of-Arms at the entrance to the concourse.

The most conspicuous piece is a large clock-face in front of a balustrade. This piece may be called a fine work of the sculptor. It represents Lion and Unicorn rampant, sustaining a cartouche with the large clock-face, on which rests the Crown of England. The entire casing is made of Faience.

The dome is lined with Faience mosaic, which is set in sections to produce a fine architectural effect.

The entire work was done under the supervision of Mr. Harry E. Prindle, the architect of the building, who consulted constantly with the



DETAIL VIEW OF SYMBOLIC CANADIAN COAT-OF-ARMS SURMOUNTED BY MARTIAL BEAVER AT THE ENTRANCE TO THE CONCOURSE.

manufacturer of this work, and directed every detail. As the setting and assembling of the material offered special difficulties, much credit must be given the contractor.

The Higher Cost of Painting and Decoration

By Arthur Seymour Jennings, F.I.B.D.,
in February (London, Eng.) "Builder."

Notwithstanding the high prices of materials and the difficulty of obtaining competent craftsmen at the present time, it is necessary that a certain amount of painting be done, principally in connection with outside work, with the object of protecting it. And some interior decoration must also be carried out, on the principle that, although in war time we are content to wear old clothes, there is a limit to shabbiness.

The question arises, What is the best course to adopt under existing conditions? My answer is, use specially - prepared paints ready mixed for application, but select them with great care. I am well aware that there exists among master painters a strong prejudice against such preparations, principally on the ground that they do not know what such paints contain. It is claimed that when pure white lead, linseed oil and turpentine are employed, the painter knows what he is using, and in the light of his experience with such materials is able to gauge the durability of the mixture with some amount of accuracy. Now, as a matter of fact, white lead, however pure it may be and excellent as it doubtless is for many purposes, is nevertheless not the best pigment to use under certain circumstances. An admixture of pigments, such as two-thirds of white lead, about one-third of zinc-oxide and a small proportion of inert material, gives far better results, but this opens up a wide question which need not now be discussed. The point is that the actual mixing of paint is the operation which necessitates the most expert experience. If a paint is imperfectly or improperly mixed a durable job is impossible. By using a first-class prepared paint one-half the difficulties vanish.

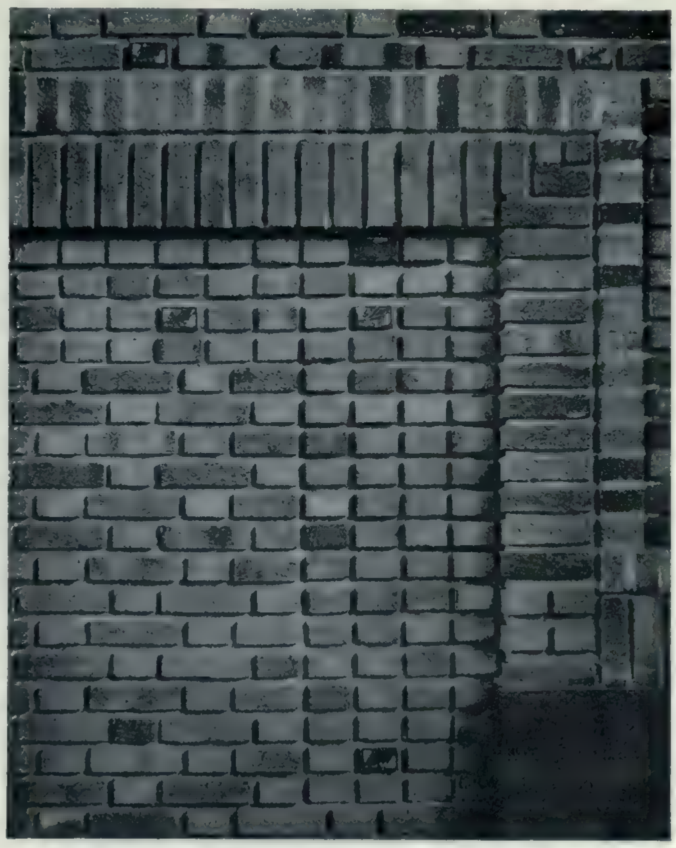
A PARTIAL VIEW OF DOME AND CARTOUCHES AND OTHER FAIENCE DECORATIONS.

We take a first-class brand of ordinary oil paint, ready prepared for application and suitable for use either inside or outside, by way of example. The best paint of this description costs at the present time rather more than one mixed in the ordinary way from white lead, because it contains a proportion of zinc-oxide in its composition. That pigment, while adding considerably to the durability, is very high in price at the present time for reasons which will be readily understood. Such a paint, however, being of really good brand, is sure to be thoroughly well mixed by ingenious machinery, and is always entirely free from "specks" and "bits" which so seriously mar the work when an improperly mixed and strained paint is used. Another objection raised by painters to the use of ready-mixed paints is this, they claim that the quantity of thinners, *i.e.*, linseed oil and turpentine, must be varied according to the nature of the surface to which the paint is to be applied, and this is true enough, because it is obvious that a very absorbent surface will require the use of considerably more thinners than one which is not absorbent. Although the mixed paints contain a uniform quantity of thinners, it is an easy matter to pour off a part of the oil and turpentine which is always found at the top of the can should the work to be painted be of a very non-absorbent character, and it is equally easy to add a little turpentine and oil when greater fluidity is desired.

Contrary to the prevailing opinion, it is the preparatory work in painting that is really of much more importance than the finishing coats, because, if the foundation is bad, the job can never be made a good one. If, therefore, one had to deal with a staff of, say, half a dozen men, but only one or two of them were experienced, they should devote their time to the stopping and preparation of the wood and other work, and particularly to seeing that the paint is suitable in consistency for the job in hand. The experienced man will know the necessity of varying the amount of thinners in each coat not only according to the condition of the surface to which it is to be applied, but also in order to ensure that alternate coats are "sharp," *i.e.*, mixed with plenty of turpentine and comparatively little oil, and glossy, which means less turpentine and more oil. By alternating the coats in this way the most perfect adhesion between them is produced, and it is for this reason that in any ordinary painted work the coat immediately under the finishing coat is mixed to dry almost flat if the finish is to be glossy, and it is for the same reason that the work which is to be finished with enamel or varnish is always done with a flat coat immediately beneath such varnish or enamel.

DETAIL VIEW OF FAIENCE DECORATION IN POLYCHROME AND GOLD.

The work having been properly prepared and the paint properly mixed, the application must be done with the best labor available, and if this is the work of an inexperienced man, who can, however, handle a brush, the great thing to impress upon him is the fact that he must well "brush out" the paint. In other words, he should use as little paint as he can to cover the required surface. If he will regard the paint as being very precious and use it accordingly, he will be likely to meet with some success. Amateurs almost invariably put far too much paint on their work, and this gives rise to runs, wrinkling and many other troubles. Varnish and enamel are applied on exactly the opposite principle; instead of using as little as possible, one puts on as much as the surface will take, carefully avoiding, however, any risk of runs. A simple but effective knack used by painters



AN EXAMPLE OF TAPESTRY BRICK WORK, QUEBEC STATION.

after painting or varnishing a door, particularly the latter, is to always complete the operation by drawing the brush from the bottom of the woodwork in an upward direction.

Perhaps no part of the exterior work of buildings in these days can be considered more important or necessary to be kept painted for protective purposes than iron, because, when once rust commences, it is very likely to spread rapidly. Exterior ironwork which forms part of buildings does not require the high degree of finish necessary for internal work. The success here depends upon two principal factors, the first a complete removal of all rust, and second, a selection of paint specially designed—I use the word advisedly—for the purpose of protecting iron or steel. If the ironwork is badly rusted in places, it may be necessary to burn off all the old paint and to follow with a thorough scraping, in order to get a clean surface. The use of wire brushes is strongly recommended for this purpose. They may be had in varying degrees of flexibility and in several shapes, such as that of an ordinary housemaid's scrubbing brush, while others are in form very much like a large tooth brush.

As to the paint which is best calculated for the preservation of iron when exposed to the weather, much difference of opinion exists. Some architects and builders prefer red lead to anything else, and add a little lamp black to tone down the color when it is necessary, others again much prefer iron-oxide, while graphite has also many experienced men in its favor. Here again the subject is too large to treat at length in this article. The writer's opinion is that the best paints are those which are specially prepared for application to iron; there are many excellent brands on the market which are the result of observations conducted for many years. They almost invariably consist of an admixture of pigments specially selected for the purpose, and are more expensive than either of the paints already mentioned. When it is considered, however, that the cost of applying a paint is at least twice that of the cost of the paint itself it will be seen that there is no economy in using anything but the very best paint that can be manufactured for the particular purpose in hand.

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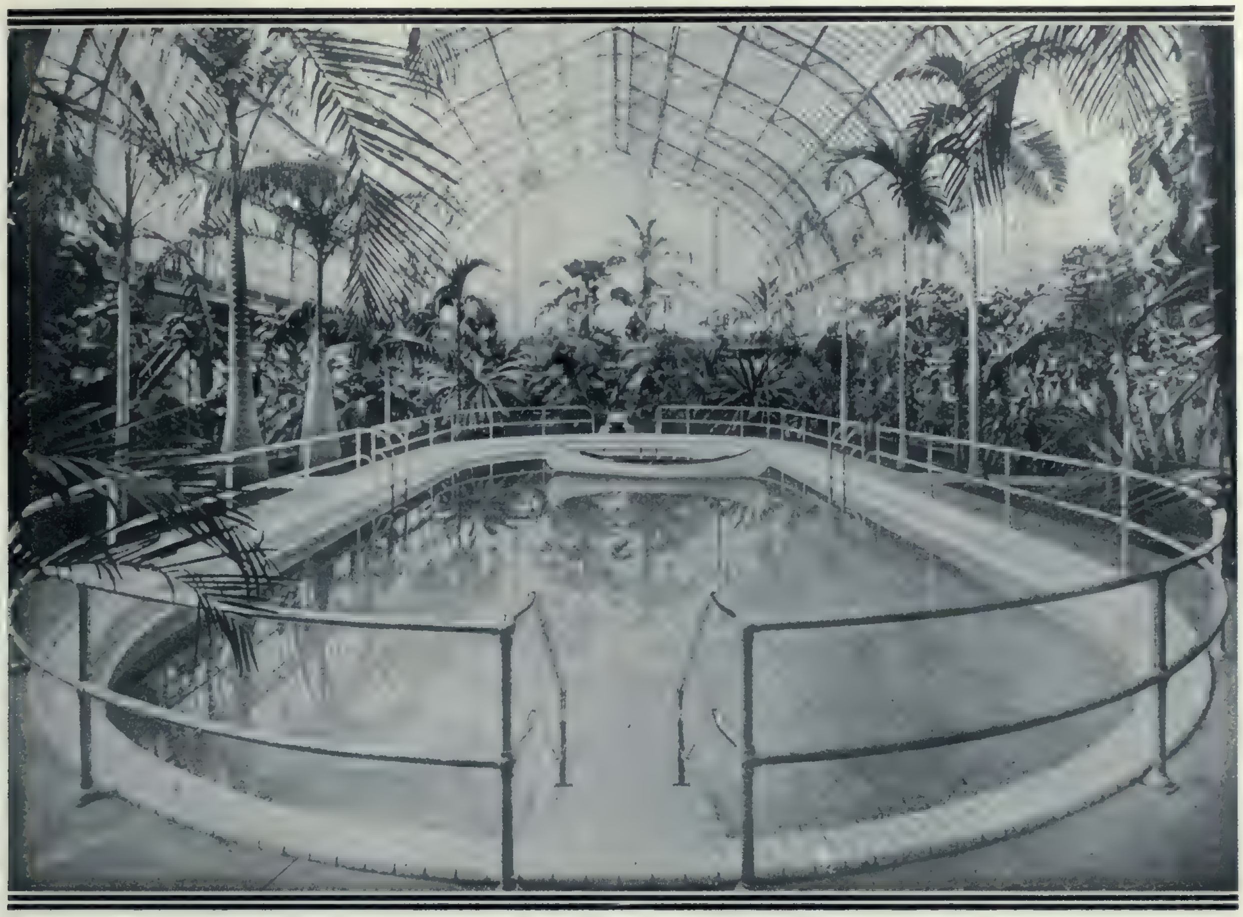
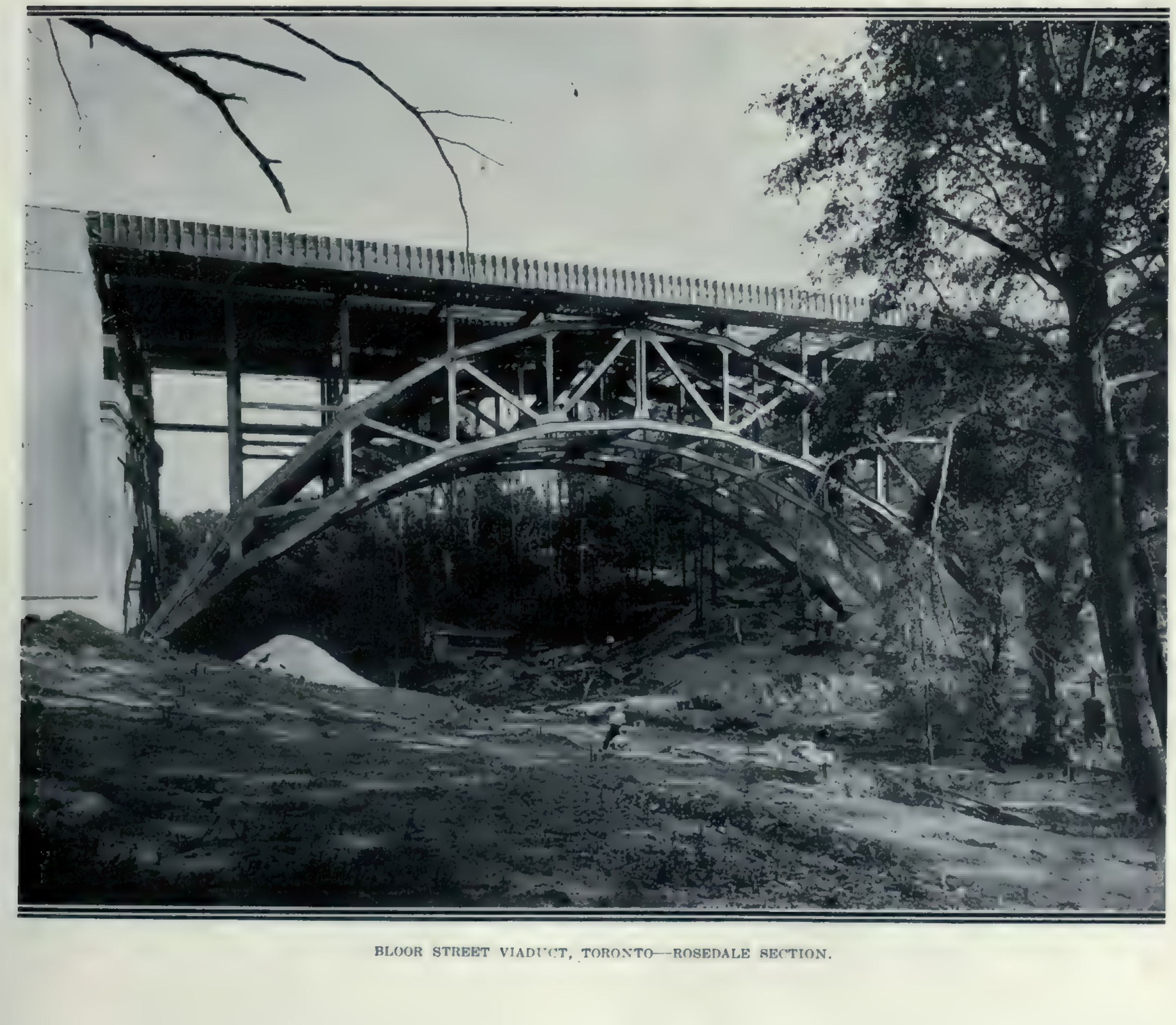
Tungsten Production From Canadian Ores

Considerable interest has been aroused by the details recently published as to the production of tungsten in England from ores mined in the Dominions. Tungsten is an essential ingredient of high-speed steel, and previous to the war Germany had practically a monopoly of the supply. This is no longer the case, a powerful British company having been formed to develop the industry for Imperial use exclusively. Tungsten is an exceedingly refractory substance with a melting-point higher than that of any other metal, its fusing temperature being about 3050 degrees centigrade. It is that characteristic that makes it suitable for electric-lamp filaments. It is so hard that it will scratch glass, and it is unaffected by most acids, while it does not rust; and tungsten drawn wire is stronger than the strongest steel piano wire. Until the electric furnace made possible the production of pure tungsten from the ore it was not available for commercial purposes, and it is only within recent years that methods have been evolved for producing pure metallic tungsten, and more recently for drawing it into wire. Tungsten as ordinarily supplied is exceedingly brittle, and it was long considered impossible to make it ductile so that it might be drawn into a wire. However, untiring research in the Mazda Lamp Laboratories was eventually crowned with success, and the seemingly impossible became an established fact. In the early stages of the development of drawn tungsten wire its production was attended with the greatest difficulty. At first a piece of a few feet long was a wonder, but now a piece a mile long, and of absolute uniform diameter, is commonplace. A filament of drawn tungsten wire can now be made far more accurately and of more uniform quality than the old carbon filament. It is acknowledged that the discovery of the process of rendering tungsten ductile is one of the greatest scientific discoveries of recent times. Since tungsten has been available in ductile form its uses have greatly multiplied. It is coming into general use as a contact material for electrical apparatus, for special electrical furnaces and for other purposes where a high melting point is essential. Another interesting use for tungsten is for targets in X-ray tubes. Dealing more specifically with the use of tungsten for the filaments of incandescent electric lamps, it will be realized how great is the value of this improved form of filament when it is stated that from the latest Mazda half-watt type lamps an equal amount of light can be obtained by its use for a power consumption of approximately one-eighth that needed when carbon filaments were the only type available. The light given by the half-watt type of lamp with this filament is exceedingly brilliant, and closely resembles daylight. In view of the present need for economy the drawn tungsten wire filament for electric lamps is of national importance. It is interesting to note, by the way, that the supply of tungsten for filament making does not interfere with national requirements in connection with high-speed steel, etc., as the amount required by comparison is extremely small—a handful of the bright steel grey powder, with peculiar metallic lustre, being sufficient for the manufacture of a thousand or more electric-lamp filaments.



A PALM GARDEN POOL IN SAN FRANCISCO, CAL.



BLOOR STREET VIADUCT, TORONTO—ROSEDALE SECTION.

Practical Perspective Methods For Office Use

An Interesting Article With Accompanying Illustrations by Robert Fuller Jackson.

THE use of perspective drawings in architects' offices is so general and important that no draftsman's training can be considered complete without a fair knowledge of the subject. Unfortunately, most draftsmen dislike perspective work and never attain proficiency in it, because as ordinarily taught it is unnecessarily slow and tedious. The purpose of these articles is to explain some methods and devices by means of which the work of laying out perspective drawings may be materially lessened. These methods are not original, but they are far less known than they should be, in view of their great value to the profession.

In approaching the subject, a few definitions are necessary. The following is a list of the terms and abbreviations most generally used, with an explanation of their meaning. While this is the general use of these terms, they vary somewhat in different treatises on the subject.

Picture Diagram—the image projected upon the picture plane seen in elevation from the front side, including the perspective projection of the object, called the picture.

P.P.—Picture Plane—vertical plane of projection on which the picture is made.

S.P.—Station Point—the observer's eye.

C. of V. or C.V.—Centre of Vision—the point directly opposite the eye and level with it.

Visual Angle or Angle of Vision—the angle determined by the extreme limits of the object included in the picture from the observer's eye.

C.L.V. or C.L.—Centre Line of Vision—formed by the vertical plane through the S.P. with horizontal planes in plan, and with P.P. in the picture diagram seen in elevation.

Receding Line—one that is not parallel to P.P.

Vanishing Line—one that goes to a V.P. in perspective.

V.P.—Vanishing Point.

D.P.—Distance Point—the V.P. of a line at 45 degrees to P.P. in plan.

D.V.P.—Diagonal V.P.—or V.P. of the bisector of an angle of 90 degrees in any plane.

M.P.—Measure Point—the V.P. of a line which makes equal angles with a receding line and with P.P. in plan.

H.L.—Horizon Line—the eye level in the picture diagram, or section diagram, or on elevations.

Other H.L.'s or Vanishing Trace of Planes—used loosely to denote any line toward which parallel planes vanish in perspective, whether the planes are horizontal, vertical, or inclined. The drawings show that no confusion results from this notation.

G.L.—Ground Line—the horizontal scale line formed on P.P. by any horizontal plane which cuts it.

L. of Hts.—line of heights or vertical scale line.

A perspective drawing can be made without the use of V.P.'s or M.P.'s, but the time saved by their use is worth saving if there are several parallels to be drawn.

Any V.P. (whether a V.P., D.P., D.V.P., or a M.P.) is found on P.P. by drawing through S.P. in plan a vanishing line parallel to the given line whose V.P. is required.

The V.P. is then transferred to the horizon in the picture and used for all lines parallel to the given line.

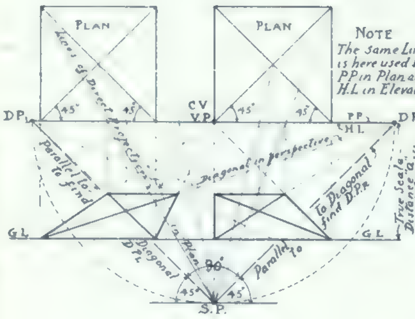

PLAN
PLAN
NOTE
The same Line is here used for PP in Plan and H.L in Elevation
DPL
CV
VP
PP
HL
DPR
45°
45°
45°
45°
Lines of Direct Projection
Parallel to find
Diagonal in perspective
To Diagonal to find D.P.R
True Scale Distance "a" below HL
GL
GL
Diagonal D.P.L
in Plan
Parallel to
90°
45°
45°
S.P.

Figure 1

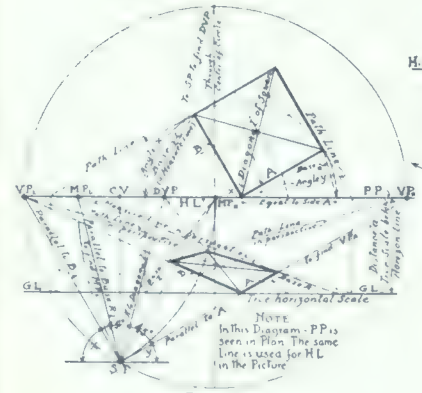


Figure 2

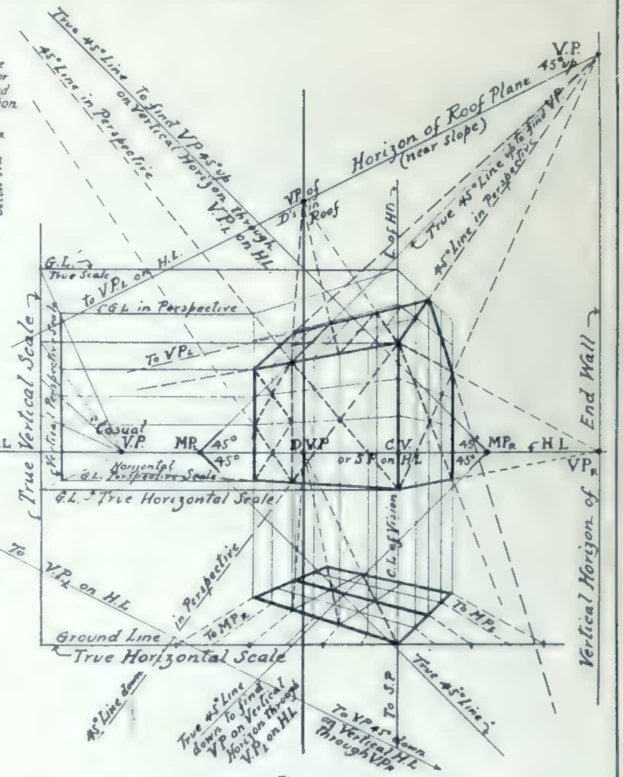

True 45° Line To find VP 45° up on Vertical Horizon through V.PL on HL
45° Line in Perspective
V.P. 45° up
Horizon of Roof Plane (near slope)
True 45° Line up to find VP
45° Line in Perspective
VP of D's in Roof
L of Hts
G.L. True Scale
to VPL on H.L.
G.L in Perspective
To VPL
True Vertical Scale
Vertical Perspective Scale
Casual V.P.
H.L
MPL
45°
45°
DVP
C.V. or S.P on HL
45°
45°
MPR
HL
VPR
Horizontal G.L. Perspective Scale
G.L. True Horizontal Scale
End Wall
Vertical Horizon of End Wall
C.L. of Vision
To VPL on H.L
in Perspective
To MPR
To MPL
Ground Line
True Horizontal Scale
45° Line down
True 45° Line down to find VP on Vertical Horizon through V.PL on HL
To S.P.
To VP 45° down on Vertical H.L through VPR
True 45° Line

Figure 3

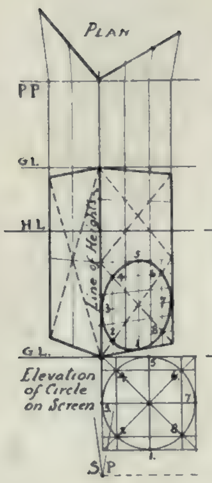


Figure 4

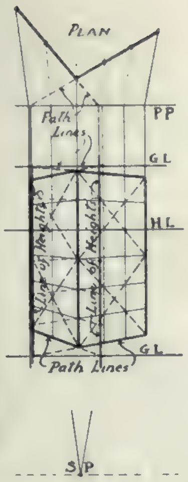


Figure 5

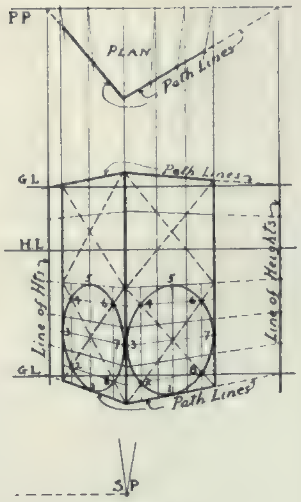


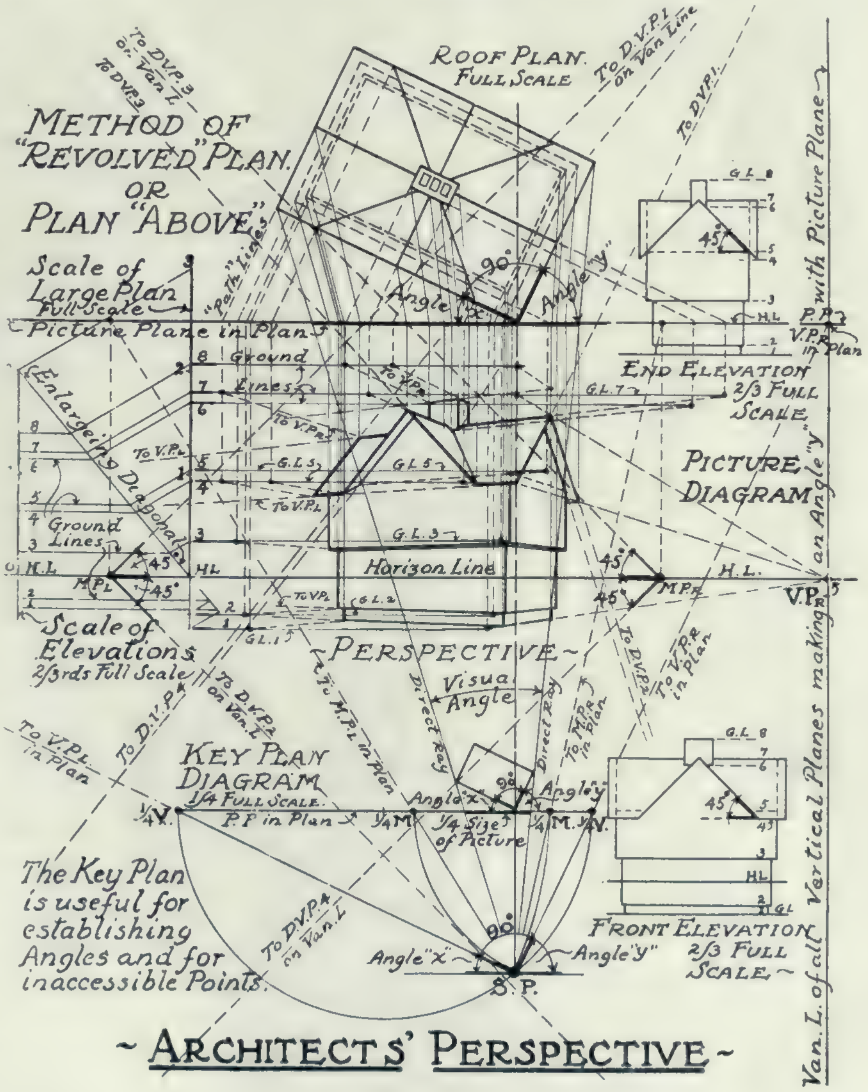
Figure 6

MEASURE POINTS. The theory of the M.P.'s is simple. In Figs. 1 and 2 receding lines vanish to their proper V.P.'s. To divide or mark off in perspective these lines into definite divisions or lengths, the principle of the isosceles triangle is used. Lines drawn parallel to the base of an isosceles triangle cut its equal sides in the same measures or divisions. The receding lines are drawn in perspective, and the required divisions are laid off on the other sides in the P.P. (on a G.L.) and taken to the V.P.'s of the bases of the isosceles triangles. In Fig. 1 the base makes an angle of 45 degrees with P.P., and its V.P. is D.P., which is thus the M.P. for perpendiculars to P.P. In Fig. 2 the V.P.'s of the bases of the two isosceles triangles formed by them and the receding lines and the sides in P.P. are the M.P.'s of the receding lines. The short way of finding any M.P. of a line is to lay off the distance from its V.P. to S.P. on H.L. This obviates the use of the plan in fixing M.P. on H.L. Fig. 2 also shows two ways for finding the D.V.P. (1) By drawing a vertical through the centre of H.L., between the two V.P.'s, and connecting the upper end (on the circle) with S.P. Where this line cuts H.L. is the D.V.P. (2) By bisecting the 90 degree angle formed at S.P. by the two vanishing parallels. Where the bisector cuts H.L. is the D.V.P.

HEIGHTS IN PERSPECTIVE. The level ground on which an object stands is a horizontal plane. Where it cuts P.P. is the ground line, a true scale line from which heights can be measured vertically. There is properly only one G.L., but custom calls all horizontal lines formed by horizontal planes cutting P.P., G.L.'s, so that by extending the horizontal plane containing any point or line till it cuts P.P., the scale height is determined in the picture. In Figs. 1 and 2 the G.L. is distance "a" below H.L., which is the height of the figure below the eye. What we term path lines are lines which recede in perspective to a V.P. To find the height of a path line, it is extended to cut P.P. at its true scale vertical distance from H.L.

If a vertical plane or wall of heights is drawn through any path line, it will cut P.P. in a vertical line called a line of heights, and any height in that plane can be scaled on this line, and carried back to V.P. by horizontal parallels to find the perspective heights of points in that plane. (See Fig. 3.) It is convenient to use a L. of Hts. in the left margin of the picture, out of the way of other lines, to avoid confusion. Any "casual" V.P. may be taken on H.L. for carrying back into perspective horizontal parallels of height, laid off on this scale line of heights; and G.L.'s carried horizontally until they cut this wall of heights can be measured at that perspective distance on a vertical scale line of heights there, or can be taken forward along the path wall to the larger scale L. of Hts. in the P.P.

This matter of finding heights is often puz-



- Figure 7

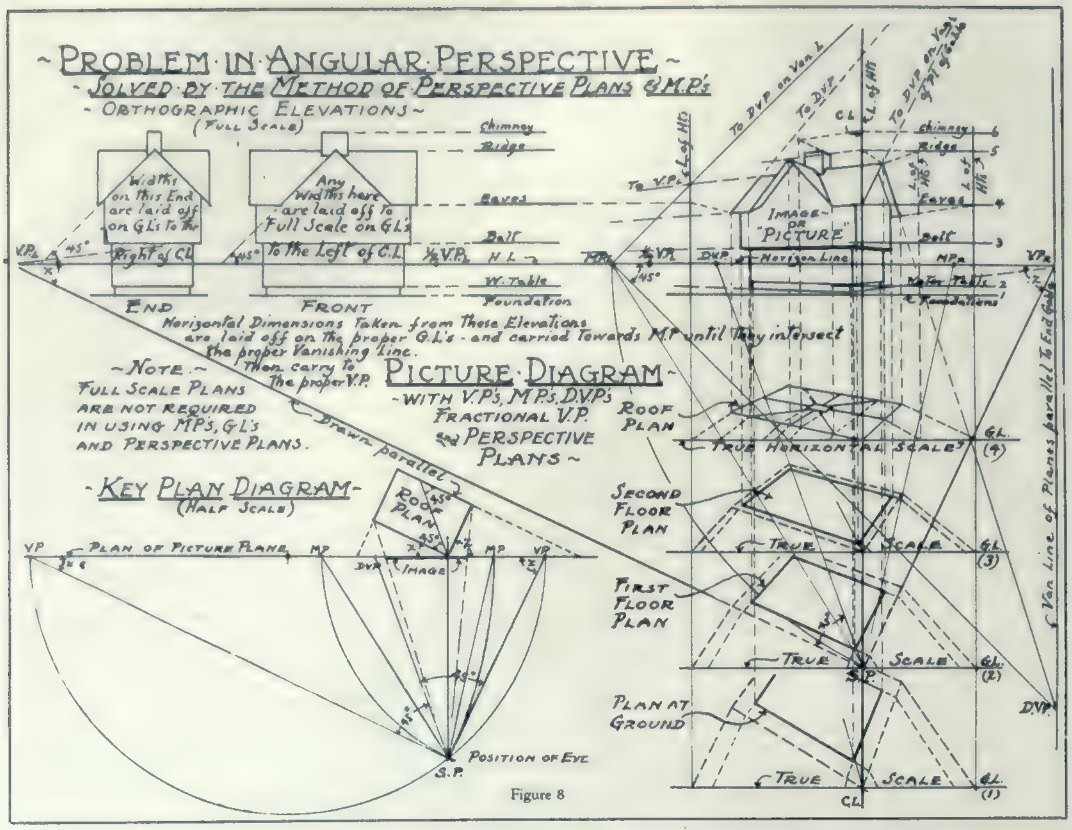

~ PROBLEM IN ANGULAR PERSPECTIVE ~
~ SOLVED BY THE METHOD OF PERSPECTIVE PLANS & M.P.'s
~ ORTHOGRAPHIC ELEVATIONS ~
(FULL SCALE)
Chimney
Ridge
Eaves
Belt
H.L.
W. Table
Foundation
Widths on this End are laid off on G.L's To the Right of C.L.
Any Widths here are laid off to Full Scale on G.L's To the Left of C.L.
END
FRONT
Horizontal Dimensions Taken from These Elevations are laid off on the proper G.L's - and carried Towards M.P. until They intersect the proper Vanishing Line. Then carry to the proper V.P.
~ NOTE ~
FULL SCALE PLANS ARE NOT REQUIRED IN USING M.P's, G.L's AND PERSPECTIVE PLANS.
PICTURE DIAGRAM ~
~ WITH V.P's, M.P's, D.V.P's FRACTIONAL V.P. and PERSPECTIVE PLANS ~
~ KEY PLAN DIAGRAM ~
(HALF SCALE)
Drawn parallel
ROOF PLAN
PLAN OF PICTURE PLANE
VP
MP
DVP
IMAGE
45°
POSITION OF EYE
S.P.
To V.P.L
L. of Hts
To D.V.P. on Van. L.
To D.V.P.
C.L.
L. of Hts
To D.V.P. on Van. L. of Pl. of Gable
IMAGE OR "PICTURE"
Horizon Line
M.P.L
½ V.P.
D.V.P.
M.P.R
V.P.R
Water Table
Foundations
ROOF PLAN
TRUE HORIZONTAL SCALE
SECOND FLOOR PLAN
FIRST FLOOR PLAN
PLAN AT GROUND
TRUE SCALE
G.L. (4)
G.L. (3)
G.L. (2)
G.L. (1)
D.V.P.
Van. Line of Planes parallel to End Gable

Figure 8

zling to draftsmen, but is so simple if once understood that space will be given to a full explanation of finding lines of heights for different positions of the P.P. in relation to the object in plan.

In Figs. 4, 5 and 6 a double fold screen is shown in angular perspective. The P.P. is taken in Fig. 4 on the corner of the screen; in Fig. 5 P.P. is taken forward of the screen; in Fig. 6 P.P. is taken back of it. If P.P. touches a receding line of the plan, a line of heights can be erected at this point. In Fig. 4 this corner lies in both of the receding lines representing the two planes of the screen, and it also lies in the P.P. Therefore a L. of Hts. at this point serves for finding the heights of horizontal lines in both planes, which are thus walls of heights.

If the P.P. cut the screen back of the corner, two lines of height could be erected, one at each point where it cuts the two receding lines. In Fig. 5 P.P. is wholly in front of the screen, so that it does not touch or cut either receding line unless they are extended purposely. They are so extended in order to establish points on P.P. for erecting L.'s of Hts. Still being path lines, receding to V.P.'s, heights of points in either plane can be scaled on each line of heights and carried back to their perspective positions as determined by direct projection in plan, or by using measure points and G.L.'s for measuring their horizontal distances from P.P. along the receding path lines which contain the points. Fig. 6 differs from Fig. 5 only in that the receding path lines are extended backward to cut P.P. instead of forward, in order to establish L.'s of Hts. From these, at true scale, the heights are carried forward from the proper V.P. along the proper path line to the proper perspective positions of the points, by the same methods as in the other cases.

WORKING METHODS. There are several methods of making a perspective drawing. The two most commonly used are the "revolved plan" and that of the "measure points" for finding the perspective location of points; both methods employ the G.L.'s and the lines of height.

Parallel perspective differs from angular perspective only in the fact that in the first the main lines are parallel with P.P., and in the latter the main lines make angles with it. The principles of both are identical.

Fig. 7 shows a building solved by direct projection in plan, and Fig. 8 shows the same building solved with M.P.'s, with auxiliary perspective plans for each separate storey.

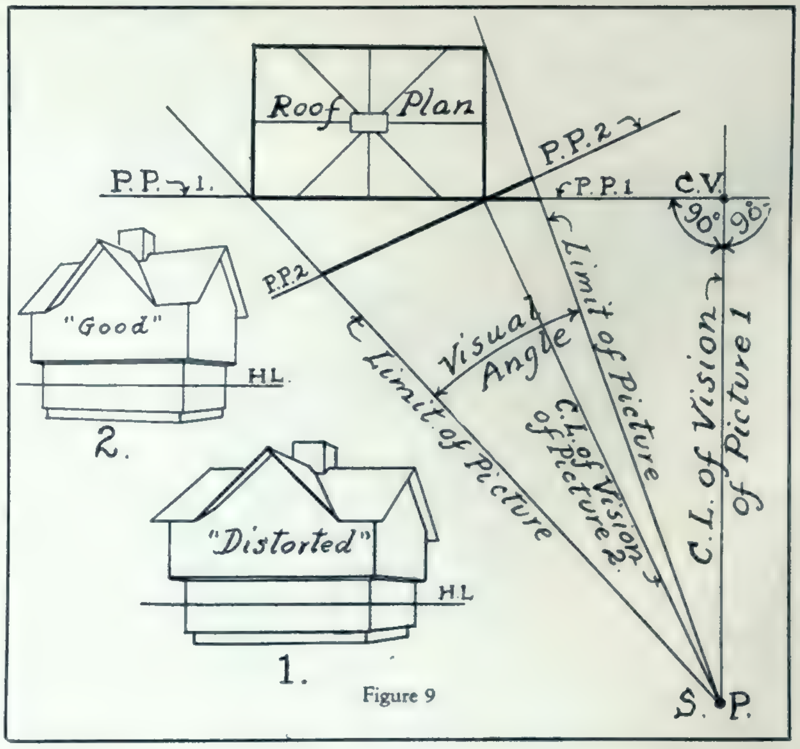


Figure 9

The Perspective Plan. The use of a perspective plan when the solution is by M.P.'s is especially valuable for finding the position of points in planes near the horizon. This is because the lines (measure lines and receding lines in perspective) which determine the positions of the points become so flat that their intersection is apt to be indefinite. By taking a G.L. far from the H.L. their intersecting angle becomes acute, thus making the point of intersection definite. Another purpose of taking a G.L. far above or below the H.L. is to keep the auxiliary plan away from the main picture, thus avoiding the confusion of crowded lines.

The height of the plane on which the perspective plan is made for the sole purpose of locating position of points does not affect their actual height positions, which are found on lines of height erected on path lines cutting P.P. as described above.

The use of M.P.'s and the perspective plan obviates the necessity of a plan diagram, and enables the whole process to be kept within a small compass in the picture diagram. It also serves as a record of the work at all stages, so that a drawing partially completed can be left and finished later by another draftsman, while the use of the revolved plan gives no such record of positions of points which have been ticked off from the plan. This method also enables corrections and changes to be made, and parts of the design to be studied in perspective and put back into plan and elevation without confusing the drawing.

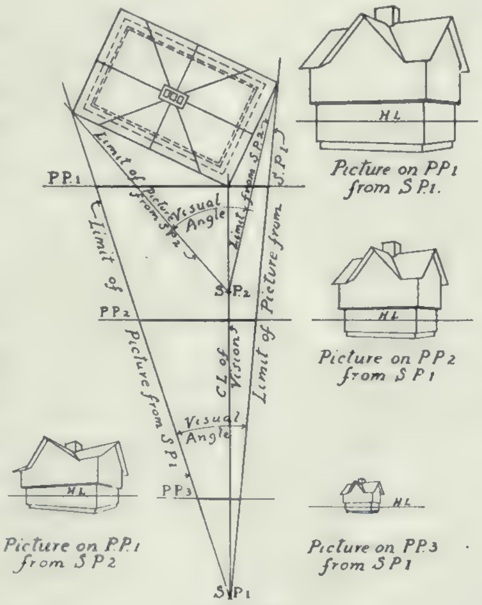


Figure 10

Distortions. Probably the most common fault made in drawing perspectives is in choosing an unfortunate position for S.P. A good rule is to place it in front of P.P., so that the width of the picture limits is included within the normal visual angle.

If the S.P. is too close to the object, the extreme high and low vanishing lines will make disagreeably sharp angles with H.L. If it is taken too far away, the vanishing lines will become more and more flat, or parallel with the horizon line in proportion to its distance from the object. This effect is one that is seen in a photograph taken with a telescopic lens. It is restful, but is not often natural, and in the making of a perspective drawing a distant S.P. means that at least one of the V.P.'s will be so far away on the H.L. as to become impracticable. Certain devices are used when these inaccessible V.P.'s occur, which will be described in the second paper of the series.

In selecting a viewpoint so as to bring into view the best features of the subject, the easiest method is to draw the P.P. in plan, and to place the plan of the object with a corner on P.P. At a point approximately opposite the centre of interest, locate S.P. at such a distance in front of P.P. that the visual angle determining the limits of the picture, formed by enclosing lines from the outer points of the plan to the S.P., will make an angle of less than 60, and preferably little more than 30 degrees.

It is better to revolve the plan so that one side makes a greater angle with P.P. than the adjacent one, both because one side of the object usually has more of interest to be shown, and because vanishing lines to two equidistant V.P.'s are stiff and monotonous. In other words, it is better practice to place the plan so as to make unequal angles with P.P. rather than to place it so as to make two angles of 45 degrees and move the centre of interest to one side of the centre line of vision in order to make the V.P.'s unsymmetrical. The reason is that if the centre line of vision is made to fall outside of the visual angle, the resulting perspective is distorted and unnatural. Fig 9 shows this, in the case of parallel perspective in "1," while "2" shows the same building from the same S.P., but with the plan turned so as to make the C.L. of vision fall within the angle of vision.

Fig. 10 shows the distorted effect of the S.P. taken too close, at S.P. 2, and the effects of taking the P.P. at different distances but parallel to one another. The result is simply a change in size of the resulting picture, the diminution being directly proportional to the nearness of P.P. to the S.P.—"The Architectural Forum."

◆

The Anarchy in Architectural Design

A correspondent to the "Journal of the Royal Institute of British Architects" commenting on a recent address by Professor Lethaby, in which he referred to the difficulty in "getting around the corner of conflicting styles," writes, in part, as follows:

"Never in the history of architecture, during the past ten thousand years or more, has there appeared such a hybrid jumble of design, such a blind groping after right method, as has been seen in England during the last hundred years or so.

"Up to that time art was all of a piece—or at any rate it is sufficiently accurate for the present purpose so to consider it. Since then, however, architects have not been able to handle, much less weave into an orderly system of thought, the plethora of conflicting ideas and tendencies which have arisen. This somewhat startling fact appears to be accepted by the majority of architects not as a catastrophe, but as part of the inevitable scheme of things, about which we must not make much pother, or we should be regarded as cranks, to the detriment of our pockets.

"This attitude is not merely thoughtless and mistaken, it is more serious, as Professor Lethaby said, 'It is a question of survival'; for, although he used these words more especially with reference to the 'advertising plague,' I suggest he would quite as heartily apply them to the 'internal anarchy of style from which we suffer.'

"Investigations into the fundamental causes leading to the present social condition of the country have already been made, and are being made, from the standpoint of economics, etc. This is to be expected, as the economic cause precedes æsthetic reaction; but the time has surely arrived when we should strive to obtain a more precise mental articulation than we have hitherto had as to the fundamental causes which have led to our present æsthetic condition, seeing that these causes present themselves as a fairly complete chain dating back to the seventeenth century, culminating with the Gothic revival, the history of which shows how unable the architects of the last century were to grasp the metaphysical truth that 'you cannot put your foot into the same steam twice.'

"By conferences, discussion, and a considerable amount of thinking we ought to be able in course of time to evolve a body of doctrine very much sounder in its ultimate basis than the present muddlement—doctrines not to be codified into hard formulæ, but held as spiritual convictions governing decent architectural behavior. Not till then shall we be in a position to hand on to pupils and students of architecture even an elementary theory of æsthetics based upon some sort of reasonable foundation; or shall we be able to rid ourselves of the harmful incubus of the nineteenth century and speak with a voice sufficiently united and convincing to influence the world of men and things."

◆

English Banker Advocates Metric System

An earnest plea for the adoption by Great Britain of the metric system of weights and measures and the decimal monetary system was made at the annual meeting of the shareholders of the London City and Midland Bank (Ltd.) by Sir Edward H. Holden, Bart., chairman of that institution. He stated that by clinging to the old systems the country was placing a hindrance in the way of the extension of foreign trade. He said in the course of his annual address:

"I should like here to bring before you what I consider to be a most important question, and that is the adoption by this country of the metric system of weights and measures, together with a decimal monetary system. Both these systems are at the present time in use in most countries, and there is no doubt that one of the greatest hindrances to the extension of our foreign trade is the fact that we do not present our catalogues in foreign countries so advantageously as other countries. For example, Germany, before the war, had overrun Italy with her travelers. These travelers presented their catalogues to the Italian buyers in the Italian language, and they quoted their weights, measures, and prices in the metric and decimal systems, which systems the Italians themselves use. On the other hand, English travelers present their catalogues in English, with the measurements in yards, feet and inches, tons, hundredweights and pounds, and the prices in pounds, shillings and pence. Italian buyers do not understand the English system as they understand the metric and decimal systems.

"It appears to me that if we are seeking (as we are) to extend our trade to those countries where German influence has hitherto predominated we must at once begin to adopt the systems which are most easily comprehended by purchasers. The metric and decimal systems have been adopted by all European countries except Russia, and in that country these systems were before the war fast coming to the front. These systems are also used in South America and in Japan. In fact, there are few countries which do not use them at the present time. It must therefore be apparent to everyone that if we have to conduct our trade using English weights and measures, and currency, while other countries can trade with each other under the metric and decimal systems, we shall obviously be placed at a great disadvantage, and in my opinion this question ought to be taken up and pushed forward without any delay."

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The Ramparts of St. Mark's

The great Church of San Marco is now rapidly disappearing from sight behind ramparts of protection. On sunless days the church is almost pitch-dark, and it is only gradually that the eye begins to distinguish the huge piles of sandbags that smother altar, ambo, pulpit and font, the swaddled figures on the chancel screen, the muffled columns that seem dwarfed and shrunken and misshapen, and vaguely recall the proportions of some early Egyptian temple. The problem of preserving the mosaics in case of an internal explosion presents great difficulties, and is capable of merely tentative solution. So far two steps have been taken: It is proposed to spread a sheet of thick cloth all over the mosaics at a distance of about five or six inches from their surface, thus forming a cushion of air which, it is hoped, will modify the violence of an explosion and the dangerous effects of the displacement of air. Further, all the glass windows of the cupolas have been removed, and, during an attack, windows and doors are left open to diminish the shock of concussion. But, in order to prevent rain from entering the building, the place of the glass windows has been taken by screens of coarse, brownish sailcloth, stretched on iron frames with hinges which readily fall outwards.

The effect on the interior is most surprising. The light coming through these screens, especially on a sunny day, is of a soft, diffused yellow, a little brighter, perhaps, than the light transmitted through the alabaster windows of such a church as S. Antimo in Tuscany. This warm, glowing light exactly hits the key of the mosaics, which catch it, reflect it, are illuminated by it, till they reveal all the richness of their Oriental splendor. The elongated, Byzantine figures of the central dome, the ultra-marine saints of the southern, every design and legend on the blazing background, speak out and are intelligible; each cupola glitters like an inverted saucer full of molten gold, flooded and shimmering with radiant light. It is a revelation of the mosaics of San Marco; never have they been seen like this before. But we may hope that, when the war is over, and if Saint Mark's survives, the secret of lighting the cupolas, thus accidentally discovered, may be adopted permanently, and so confirm the old Italian saw that "non tutti i mali vengono per nuocere."

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The Church at Brou

It was only yesterday that we were in Bourg, yet, beyond the church of Brou and a garage, I remember nothing of the place. The garage was like other garages; but the church of Brou is like no other church in the world. In the first place, instead of dragging through centuries of building, and never quite reaching completion, it was begun and finished in the space of twenty-five years—from 1511 to 1536—and it was supervised and paid for by a single person, Margaret of Austria, who built it in fulfilment of a vow made by her mother-in-law, Margaret of Bourbon. The last Margaret died before she could undertake her project, and her son, Philibert II., Duke of Savoy, called "The Handsome," followed before he could carry out her wishes. So his duchess, the other Margaret, undertook the work, and here on this plain, between the Juras and the Saone, she wrought a marvel in exquisite church building which still remains a marvel almost untouched by any blight after four hundred turbulent years. Matthew Arnold wrote a poem on the church of Brou, which may convey the wonder of its beauty. I shall read it some day, and if it is as beautiful as the church, I shall commit it to memory, and on days when things seem rather ugly and harsh and rasping, I will find some quiet corner and shut my eyes and say the lines and picture a sunlit May afternoon and the church of Brou. Then perhaps I shall not remember any more the little mean things of the moment, but only the architectural shrine which one woman reared in honor of another.

It is not a great cathedral, but it is by no means a little church. Its lofty nave is bare of furnishings, which perhaps lends to its impression of bigness. But then you pass through the carved doors of a magnificent "jube" or screen, and the bareness disappears. The oaken choir-seats are carved with the richness of embroidery, and beyond them are the tombs—those of the two Margarets and of Philibert, husband and son. I suppose there are no more elaborately wrought tombs in the world than these. Perhaps their very richness detracts from their artistic value, but I would rather have them so, for it shows somehow the thoroughness and sincerity of Margaret's intent—her determination to fulfil to the final letter every imagined possibility in that other's vow. The mother's tomb is a sort of bower—a marble alcove of great splendor within and without. Philibert's tomb, which stands in the centre of the church, between the other two, is a bier supported by female figures and fluted columns, and interwoven decorations, exquisitely chiselled. Six cherubs and a crouching lion guard the royal figure above, and the whole, in spite of its richness, is of great dignity. The tomb of the Duchess Margaret herself is a lofty canopy of marble incrustations, the gorgeousness of which no words can tell. It is the superlative of Gothic decoration at a period when Gothic extravagance was supreme.—Harper's Magazine.

◆

Conservation Report on Pine Rust

Through the invasion of the "white pine blister rust," a virulent fungus disease imported from Germany about seven years ago, Canada is seriously threatened with the extermination of her white pine resources, probably the most valuable forest asset of Eastern Canada. This disease has destroyed the white pine in Europe, has made serious ravages in the pineries in the north-eastern states, and is spreading in Ontario and Quebec. Centres of invasion are scattered from Maine to Minnesota in the United States, and from South-western Ontario to Southern Quebec in Canada, the Niagara peninsula being the most seriously infected district in the Dominion.

For its full development and for transmission to the pine, the disease is dependent on the currant and gooseberry bushes. The fact that it cannot spread directly from one pine to another offers a means of control, and no effort should be spared to combat the rust by exterminating the currant and gooseberry bushes in infected or exposed districts, or at least by prohibiting the shipment from these regions of all currant and gooseberry bushes and fruit, and by placing an embargo on the importation of such stock. Unfortunately, the wild gooseberry is equally dangerous as an intermediary in spreading the disease.

Any loss entailed by even the total destruction of the whole currant family is insignificant compared to the value of the white pine in Canada. In 1914 the white pine production of Eastern Canada, including logs and sawn lumber, totalled $16,160,000. The cutting and manufacture of this timber furnishes employment to thousands of men, and supplies hundreds of industries with raw material for which no satisfactory substitute can be secured. The white pine is one of the most important taxpayers in Canada, and contributes no less than $1,250,000 to the total revenue of about $4,000,000 which the four Eastern Provinces derive annually from their forests. In view of these facts it is evident that drastic measures should be taken at once to eradicate the disease which threatens this resource.

Iron Industry in 1916

The Dominion Department of Mines has received from the producers a record of the production of pig iron and of steel ingots and castings during the first eleven months of the year which, together with estimates for December, show a probable production of pig iron in Canada during the twelve months ending December 31, 1916, of 1,171,727 short tons (1,046,185 gross tons), and a probable production of steel ingots and direct steel castings of 1,454,124 short tons (1,298,325 gross tons), of which 1,423,485 short tons were steel ingots and 30,639 short tons were direct castings.

The production of pig iron in 1915 was 913,775 short tons, and of steel ingots and castings 1,020,896 short tons, showing an increase in the production of pig iron in 1916 of about 28 per cent., and an increase in production of steel ingots and castings of over 42 per cent.

The 1916 production was greater than that of any previous year, the second largest production of pig iron having been 1,128,967 short tons in 1913, and of steel ingots and castings 1,168,993 short tons also in 1913.

The production in 1916, during the first six months and monthly during the last six months, was as follows in gross tons:

	Pig Iron. Gross Tons.	Steel Ingots. Gross Tons.	Direct Castings. Gross Tons.	Total Gross Tons.
Six months ending June.......	501,872	577,999	11,715	589,714
July	82,154	101,178	2,284	103,462
August	78,450	108,889	2,299	111,188
September	91,736	116.828	2,524	119,352
October	101,436	126,677	2,924	129,601
November (partly estimated)	95,237	119,468	2,745	122,213
December (estimate)	95,300	119,930	2,865	122,795
Six months ending December..	544,313	692,970	15,641	708,611
12 months ending December..	1,046,185	1,270,969	27,356	1,298,325

Of the total production of steel ingots and castings in 1916, about 43,790 short tons (39,098 gross tons) were made in electric furnaces. In 1915, only 61 short tons were reported as having been made in electric furnaces.

Photo by courtesy of White Pine Bureau.

A PLEASING MODERN ADAPTATION OF THE COLONIAL HIPPED ROOF FARM HOUSE.

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Meeting of The Council

A meeting of the Council of The Royal Architectural Institute of Canada will be held at the Chateau Laurier, Ottawa, Ont., on Saturday, the 28th April, 1917, at one o'clock p.m. for the consideration of very important matters, to decide where and when the Tenth General Annual Assembly will be held this year, the creation of the R. A. I. C. Medal, the celebration of the Tenth Anniversary, etc. It is expected that every member of the Council will be present.

J. P. Ouellet, President.
Alcide Chausse, Hon. Secretary.

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The Portland Cement Industry

"The Architect and Contract Reporter" of London, in a recently published article on the Portland cement industry, states that the three largest cement producing countries and their output is as follows: Great Britain, 3,000,000 tons; Germany, 5,000,000 tons, and the United States, 15,348,000 tons. Referring to the causes for the relatively small production in England, the article continues:

"As in so many other branches of industry in this country, our manufacturers of Portland cement have been content to do as their fathers did—to continue the use of antiquated machinery and antiquated methods, while their competitors overseas were introducing and utilizing every possible improvement that would tend either to the higher quality of the product or the reduction of the cost of producing. Not only were our manufacturers for the most part content to rub along in the old way, but even if they wished to adopt newer machinery they had to go abroad for it.

"Up to within a few years ago most of the machinery came from Germany, as no British firm was prepared entirely to equip works with plant embodying the new designs, although there were firms who could supply certain parts. It is gratifying to note that this unsatisfactory state of things no longer exists, and British-made cement-making machinery can now challenge comparison with anything of the kind manufactured in Germany.

"We still, however, remain markedly inferior to our competitors in the United States; and much remains to be accomplished in the designing of Portland cement machinery in this country to bring it to the same standard of efficiency that now prevails in the United States."

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Business Activity After The War

There is more reason to anticipate business activity after the war than business depression. For years the farmer will enjoy high prices for his products. Shipbuilding is being established as one of the industries of the Dominion. Aeroplane manufacture promises to be another. Industrial demands for the reconstruction period in Europe will provide work for transformed munition factories. Immigration will provide labor as well as increase the agricultural population. America enjoyed financial prosperity after the Civil War. The demand for raw materials, for manufactured products and for workmen should insure good business and good wages in the Dominion for years.

◆

Oldest Stone Structure

Scattered through the world are the remains of stone structures, in various states of preservation, that had their origin before the dawn of recorded history. Even on the Western Continent, in Mexico, Central and South America, are ruins showing the proficiency in stone working of the makers, of whom we know little or nothing. There are cyclopean walls in the old world that seem to have been erected by a race of giants, the very memory of whom has disappeared, save for these monuments. But it may, we think, be doubted whether there is a single stone structure in any part of the world that antedates the pyramids at Sakkarah, Egypt, close to the ruins of the great city of Memphis. The oldest and most famous of the eleven pyramids standing on the Sakkarah plateau is that peculiar stepped and truncated pyramid called by Arabs Mastabatel-Pharaoon. It is, of course, impossible to fix its date with any degree of accuracy, but the consensus of opinion is that it is the oldest large structure of cut stone that is now standing in the world.

Architectural Digest

Articles of More Than Passing Interest From Our Contemporaries

FUNDAMENTALS OF SPECIFICATION WRITING.

By Francis W. Grant.

Of all the manifold functions of an architect under modern conditions it is safe to say that the one for which his education least prepares him, his temperament least fits him, the one he least enjoys, and the one in which he makes the poorest showing, is specification writing. Nature does not seem to have intended that an artist should have to do with such prosaic work as mastering the legal technicalities, terms and processes incident to good specification writing, and the result is the free use of scissors and paste and little progress.

Exceptions are where prosperity permits and breadth of mind appreciates the employment of experts and specialists for this work, men of good judgment who have had experience in the field, and can see both sides of a question, and preferably men who do not aspire to artistic proficiency.

The writer firmly believes that the standardization of specifications should not be attempted beyond the matter of form and arrangement, and that the subject matter should be expressed in the writer's own phraseology, properly influenced by consideration of the fact that their appearance in court as evidence is a very probable contingency, and standard only insofar as precedent has demonstrated what is specific, suit-proof language and what is not.

The discussion that follows is therefore not to be taken as an attempt to formulate a model specification for copying, but is merely intended to stimulate a contemplation of the why and wherefore of that branch of the architect's work.

The general conditions only will be discussed in this series, structural conditions being made the subject of other articles now in course of preparation.

The first step incident to the preparation of a specification is to determine its form. Legal cap paper, written with a pen on both sides of the paper, and bound at the top, was the original form. To this has succeeded legal size paper typewritten on one side, with page numbering only as a method of notation. Comparatively few architects have progressed beyond this awkward form.

When circumstances permit, specifications should be printed and bound in pamphlet form of convenient shape and size, 6 by 9 inches being recommended as particularly appropriate by reason of its convenient shelving.

Convenience of usage and filing should never be overlooked, as it contributes very materially to efficiency, and, to this end, the additional expense of printing is amply justified on large work. Specifications for buildings, the cost of which exceeds, say, one hundred thousand dollars, and particularly in the case of public work, should always be printed and sufficient copies issued to cover every possible contingency.

Typewritten specifications should be on letter size paper and thus capable of convenient filing flat with related correspondence. Vertical filing of correspondence has become practically universal and it is in various ways inconvenient to have two sizes of filing devices in one's office. Specifications on legal size paper cannot be filed in standard correspondence files, and if folded as documents and so filed, they are in an extremely awkward shape for reference.

The practice of binding certain standard printed general conditions in an otherwise typewritten specification is not good. It tends to create the impression of "ready made" when "made to order" is expected and paid for. It does not command that degree of attention and respect on the part of the contractor that obtains when the whole specification is alike and made for the particular job in hand, and specifications commanding the respect of the contractors to whom they are particularly and primarily addressed will tend to bring about results meriting respect in about the same degree, seldom greater. Of course the legal virtue of the instrument is not affected by the incorporation therein of standard printed matter, but many a lawsuit would be avoided if the contractor could, by any inducement, be made to read every word of the specification at the time of bidding, and this he is more apt to do if the general conditions appear to have been written for his especial benefit.

Stereotyped general conditions, no matter how exalted their source, or how exactly fitted to the circumstances incident to one of the architect's previous commissions, are almost certain to be misfits in some one or more points, to the embarrassment of the architect employing them, this particularly if he be interested in the literary as well as the artistic success of his work. Some, of course, are not, and to such this will not appeal.

There should be a margin of at least 2½ inches provided at the left of each sheet for titles, paragraph numbering and for binding. Titles should be kept wholly without this margin and not placed so as to lead to the impression that they are a part of the text.

Binding at the top is a survival of one of the most awkward features of the specifications of former times, and is being abandoned in favor of left-hand binding by all progressive architects incidental to the adoption of letter size paper in lieu of legal size paper.

Binding should be by some such method as stapling, stitching, or pasting, as will render it impossible to remove or insert a page without such mutilation as will plainly advertise the fact. The reason for this is deemed obvious. The specification document should be capable of identification beyond question by a signature or mark on any one page, or on the cover. If the specification is so bound that pages can be changed at pleasure without detection, a positive identification would be practically impossible. A document incapable of positive identification under all circumstances is in poor form for submission as evidence in court.

A source of annoyance, loss of time, and frequently an encouragement of the habit of lax attention to specified requirements is the inefficient system of notation commonly employed, consisting of page numbers only, and these often at the bottom of the page.

The specification should be divided into consecutively numbered paragraphs from beginning to end, and if this be done and the work properly indexed accordingly, no need for page number remains.

Each paragraph should be carefully reviewed, amplified and "blue penciled" until it will stand equally well alone or in its intended relation to other paragraphs. Every possible endeavor should be made to avoid the necessity for cross reference to render any paragraph fully intelligible or complete.

The practice of subdividing the specifications into chapters, or any subdivisions whatever other than paragraphs, is to no good purpose, and particularly is it poor practice to head these chapters or parts with partial repetitions of the general conditions, or even with reminders of or references to the general conditions. The general contractor needs and wants no assistance in segregating the work of the various crafts, and the attempt to do this for him by a method so distinct as by forming the specifications into divisions or chapters intended to define and confine the duties and obligations of his several subcontractors, frequently leads to error or omission, and is furthermore not one of the architect's functions, except possibly when it is deemed necessary to split the work up into numerous separate contracts in the original letting, which procedure is not recommended.

Of course, by this it is not meant to advise the total ignoring of the customary subdivisions representing in a general way the division among separate crafts. The work should be taken up in logical sequence (the sequence of building operations), but without committing the architect in the matter of sub-contracting by stating directly or by inference just who of the various craft sub-contractors shall do this, that and the other thing.

Specifications for a building, the contract for which is to be let under one general contract, as all contracts should be let if possible, should not state that centres are to be made by the carpenter contractor, that bearing plates are to be set by the brick mason, etc., for such segregation of functions is no proper concern of the architect. That electricians and the various piping craftsmen should not be permitted to cut structural members is, however, another matter, and must be provided against.

Titles should be provided for as many paragraphs as possible, and these kept wholly outside the margin of the text, and in no instance made to read with and form a part of the text of the specifications.

An index by paragraphs should always be provided. This should be carefully cross-indexed, so that by whatever name a subject is thought of, it can be found in the index. A mere table of contents is by no means an index. If lack of time or other circumstances prevents an alphabetical index properly cross-indexed, it is better to leave it so than to introduce a mere table of contents.

Brevity should be the constant aim of the specification writer, but never at the expense of perfect clarity. The specifications must be complete, and the character of the drawings will largely determine how much must be said to make them so, for the information to be given is an absolute quantity. Leave nothing to be determined by the flexible and wholly unreliable rule of "customary practice."

That mere appearance of brevity which is secured by transferring essential provisions from the general conditions of the specifications to other instruments is not thought by the writer to be good practice, the Standard Documents of the American Institute of Architects to the contrary notwithstanding.

Every contractual relation should be shown on the drawings, or expressed in the specifications, and when once stated, either graphically or in writing, should, under no circumstances, be repeated or further explained, qualified, or discussed in the specifications or in any other instrument of the contract. There should be no such thing necessary as a separate paper called "Instructions to Bidders," and the "Bid Blank" should never be made the vehicle for specification matter of any kind whatever.

More than sufficient matter to secure beyond question a quibble-proof contract and the desired quality and quantity of material and labor is not only redundant and a debasement of the English language, but is almost sure to be prejudicial to the efficiency of the instrument.

All agreed that the ideal specification is one that is "boiled down" to the fewest words possible without the omission of any essential bit of information. The boiling-down process, however, consumes time, and specifications are frequently permitted to pass out of the architect's office more verbose and recondite than even their authors approve for mere lack of time to re-write that which should have been treated as a rough draft only. The architect who resists the pressure applied by the owner at this critical point and insists upon sufficient time to produce a finished specification, will build up better prestige for his office, and may cultivate a better impression in the mind of the owner as to the reasonableness of professional charges.

Superfluous matter in the specifications tends to conflicting, and sometimes to impossible requirements. For instance, the requirement that "all cement shall be of uniform bluish-gray color," followed by a complete schedule of the chemical properties that the same cement shall possess is superfluous and meaningless, yet might cause considerable annoyance and friction during the field education of some inspector, yet just such redundancies are common in otherwise good work.

The drawings should express everything capable of graphical representation, and the specifications should not repeat what is clearly shown on the drawings. With very few exceptions, schedules of quantities and dimensions should never be written into specifications.

Eliminate all lists of materials from specifications. Drawings so incomplete that quantities and dimensions cannot be taken from them by the contractor are not ready for the specification writer, and are most certainly not ready for submission to bidders. The builder alone should be held responsible for the correctness of the quantities upon which he bases his proposal to erect the building, and most builders will consider it safer to recompute quantities before investing their money at the risk of the architect's accuracy in a line wholly outside his profession.

Those architects who have entered the profession as graduates from some one of the several building crafts are the ones most liable to indulge in a display of what they are proud to advertise as an intimate knowledge of the art of building by specifying the exact number of I-beams of each dimension and their length, and other similar data distinctly within the builder's province, and not theirs.

If exact lists of quantities are out of place in an architect's specifications, approximate lists are still more so, and no attempt whatever should be made by the architect to compute quantities for builders. Exceptions to this rule are only those where it is impossible to give the necessary information on the drawing as to the number of coats of paint, size and number of hinges, etc.

A method of procedure recommended as tending to the minimum of verbiage consistent with clearness of expression is to write the first draft with perfect freedom, then "blue pencil" and eliminate as you would a telegram, giving the benefit of doubt to the retention of words and phrases in every instance.

Every item essential to a complete knowledge of what will be required of the contractor should be included. This rule should be observed to such an extent that nothing whatever remains for the formal contract, except the amount of the contract and the dates of execution and completion. When a specification is thus complete no need whatever exists for a formal separate contract instrument, and the transaction may be completed by mere exchange of a proposal in unequivocal language, properly dated and signed, and an acceptance similarly conditioned. In fact, such is the ideal form of building contract, the usual formal contract being nothing more or less than an instrument made use of for picking up items overlooked or neglected in the specifications.

The language employed in writing specifications should always be true to the title, i.e., specific, stating what must or shall be done, and never what may or should be done. The specification writer should bear in mind that he is writing law, and he must not depart from the mandatory forms of expression. Although this would seem to be self-evident, it is a fact that specifications from the best of offices are often deficient in this particular. Such are frequently not specifications at all, but mere essays on construction.

The point sought to be established by the preceding paragraph is aptly illustrated by the following excerpts from the specification for an important building, the architect for which had a national reputation and a very lucrative practice:

> " . . . and it reserves the right to waive any informality in, and even to reject any and all bids. . . . Parties who are unfamiliar with this class of work, who have never done large work, who it is well known have not the necessary plant or who have done work for . . . before, but have given unnecessary trouble to . . . or parties not known to be financially responsible, parties known to be unreliable, litigious, and have been known to do poor work, all may well save themselves the trouble of figuring on this work. . . . There are bound to be many changes in the work on so large and complicated a building as this is as it goes on . . . the plans but tentatively show how many doors there will be ultimately, or how many lineal feet there will be of partitions or of tile flooring, etc. . . . The architect has endeavored to make this specification perfectly clear and all-covering, and the bidders are requested to refrain from asking for further information, particularly before reading it all over. Unless very relevant no questions will be answered by the architect. The answering of all such questions entails considerable trouble, for if the architect does answer them both question and answer must be sent to every bidder . . . with the terms of the contract. That contract is for a complete building; it is certain that many slight changes will become necessary as the work progresses. . . . In connection with this matter of changes it is hardly possible that changes will be made that may affect the time of the completion under this contract and bond. Chances are that any changes that may become necessary will be made well in advance of the time in which special material therefor may be needed . . . should the architect desire to make a change in the material or workmanship in certain rooms or details, he is not to be confronted with the statement that such work has been ordered and partly executed."

As previously stated, the language employed in specifications must be specific. To specify that certain named articles or processes, "or equal," shall be used is not using specific language. Such qualifying clause as "or equal" has the effect in practice of losing to the owner the benefit of the architect's time and judgment used in first determining what should be used, for these words reopen the subject and invite the contractor to look the market over and let the architect know if he can do better by substituting. Most contractors are quick to accept this invitation, and the architect is then called upon to consider the comparative merits of the proposed substitution, and unless he can affirmatively declare that the proposed substitution is inferior, it must be permitted. The architect is without discretionary power in this matter, but is compelled to listen to the claims advanced in the interest of all proposed substitutions. Many contractors jump to the conclusion that "or equal" means that they shall determine what is equal, and in the absence of a clause distinctly reserving discretionary power in this matter to the architect, the courts will probably hold that they are, or at least will place the burden of proof to the contrary on the owner.

A case of record pertinent to this discussion is that of Camp vs. Neufelder, 95 Pacific 640, where the architect refused to admit that any other sidewalk light was equal to the one specified (he having specified that light or equal); the light specified was furnished, and the court compelled the owner to pay $600 extra to reimburse the contractor for what he might have saved by substituting a light he thought equal, the merits of which the architect refused to investigate.

A method capable of application to a large extent, and strongly recommended, is to describe physical or chemical properties or the functions required without using trade names. Another method is to provide for the insertion in the bid blank of a list of substitutions desired to be made by the bidder, provision being made that failure to adopt such alternative proposal bars further consideration of changes in the items for which alternate was proposed.

Specifications should be responsible to local custom and conditions, both as to materials called for and as to terms employed. No attempt should be made to write specifications for distant work until after a careful investigation of this subject. What is entirely proper in the architect's home town may be the height of folly where the building is to be erected. It discredits an architect to specify fir framing lumber where nothing but spruce or hemlock is marketed for the purpose, or Southern pine flooring where fir flooring is exclusively used; broken stone may be an appropriate aggregate for concrete, and it may be that gravel is the only available material for the purpose. These and all similar questions should be determined before attempting to write the specifications.

Summarizing, it is recommended that specifications combine the following features:

1. Should not be a combination of printed and typewritten matter.
2. Should be printed and bound in pamphlet form if possible.
3. If typewritten, should be on letter-size paper, bound inseparably at left-hand edge.
4. Should have ample margin at left, with all titles confined to margin.
5. Notation should consist of consecutive paragraph numbers, continuing through entire specification without interruption.
6. Should not attempt to define, limit or otherwise meddle with relations between contractor and sub-contractor.
7. Should be indexed and cross-indexed in proper manner, or not at all.
8. Should be as brief as the character of the drawings will permit, and as extensive as the character of the drawings demand.
9. Should be rewritten at least once before issuance, and every repetition and redundancy eliminated, and all ambiguity cleared up.
10. Should never contain quantities or dimensions not absolutely essential to a clear understanding of the drawings.
11. Should at all times be mandatory in form of expression, and never discoursive or merely permissive.
12. Should be definite, in every instance naming just what is wanted without the qualifying words "or equal."
13. Should absolutely provide against contractor's exercise of discretionary power in matter of substitutions.
14. Should be responsive to local conditions and custom, and to related legislative acts.—"American Architect."

BUILDING PERMITS.

Montreal, Que.—Permits issued for the month of March, 1917, totalled $995,920, against that of $483,420 a year ago.

Vancouver, B.C.—Permits issued for the month of March, 1917, totalled $33,715, against that of $205,465 a year ago. Total for the first three months of 1917 was $159,540, against that of $293,749 a year ago.

TECHNICAL SOCIETIES.

ALBERTA ASSOCIATION OF ARCHITECTS.—President, Jas. A. Henderson, F.R.I.B.A., Edmonton; Hon. Secretary, W. D. Cromarty, Edmonton.

ARCHITECTURAL INSTITUTE OF BRITISH COLUMBIA.—President, R. Mackay Fripp; Secretary, Fred L. Townley, 325 Homer street, Vancouver, B.C.

CANADIAN CEMENT AND CONCRETE ASSOCIATION.—President, Peter Gillespie, Toronto, Ont.; Secretary-Treasurer, Wm. Snaith, Toronto, Ont.

CANADIAN CLAY PRODUCTS MANUFACTURERS' ASSOCIATION.—President, H. P. Greaves-Walker, Toronto; Secretary-Treasurer, Gordon C. Keith, Toronto.

CANADIAN ELECTRICAL ASSOCIATION.—President, Col. D. R. Street, Ottawa; Secretary, Alan Sullivan, Confederation Life Building, Toronto.

CANADIAN FORESTRY ASSOCIATION.—President, Hon. Sydney Fisher; Vice-President, Gordon C. Edwards; Secretary, Robson Black, Ottawa.

CANADIAN GAS ASSOCIATION.—President, J. P. King, Stratford, Ont.; Secretary-Treasurer, Geo. W. Allen, 19 Toronto street, Toronto, Ont.

CANADIAN INDEPENDENT TELEPHONE ASSOCIATION.—President, F. S. Scott, Brussels, Ont.; Secretary-Treasurer, Francis Dagger, Toronto, Ont.

CANADIAN INSTITUTE, 198 College street, Toronto.—President, J. B. Tyrrell; Secretary, J. Patterson.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—President, J. S. Dennis, Montreal; Secretary, Fraser S. Keith, Montreal.

ONTARIO ASSOCIATION BUILDERS' EXCHANGE.—President, T. R. Wright, London, Ont.; Treasurer, Geo. Oakley, Jr., Toronto, Ont.; Secretary, S. Coombs, Hamilton, Ont.

MANITOBA ASSOCIATION OF ARCHITECTS.—President, Col. J. B. Mitchell, Winnipeg; Secretary-Treasurer, R. G. Hanford, Winnipeg.

MONTREAL BUILDERS' EXCHANGE.—President, J. P. Anglin, Montreal; Secretary, D. K. Trotter, Montreal.

ONTARIO ASSOCIATION OF ARCHITECTS.—President, C. H. Acton Bond, Toronto; Treasurer, J. P. Hynes, Toronto; Secretary, R. L. Wolsey, Toronto.

QUEBEC ASSOCIATION OF ARCHITECTS.—President Hugh Vallance; Treasurer, D. Norman MacVicar; Secretary, J. Emile Vanier.

ROYAL ARCHITECTURAL INSTITUTE OF CANADA.—President, Jos. P. Ouellet, Quebec; Vice-President, A. Frank Wickson, Toronto; Hon. Treasurer, J. W. Watts, Ottawa; Hon. Secretary, Alcide Chausse, Montreal.

SASKATCHEWAN ASSOCIATION OF ARCHITECTS.—President, A. Graham Creighton, Prince Albert; Secretary-Treasurer, Francis B. Reilly, Regina.

SOCIETY OF CHEMICAL INDUSTRY.—Wallace P. Cahoe, Chairman; Alfred Burton, Toronto, Secretary.

TORONTO BUILDERS' EXCHANGE.—President, S. R. Hughes; Treasurer and Acting Secretary, Jno. Aldridge.

UNION OF CANADIAN MUNICIPALITIES.—President, T. L. Church, Mayor of Toronto, Ont.; Hon. Secretary-Treasurer, W. D. Lighthall, K.C., ex-Mayor of Westmount, Que.; Assistant Secretary, G. S. Wilson, Coristine Building, Montreal.

CONSTRUCTION NEWS

Information of Special Interest to Architects, Contractors, and Manufacturers.
Construction Building Reports will Give You Up-to-date Information Every
Day on all New Buildings About to be Erected or in Course of Erection.

BUSINESS BUILDINGS.

Hamilton, Ont.—Architect W. J. Carmichael, Montreal, has prepared plans for a telephone exchange for the Bell Telephone Company, to cost $30,000, at the corner of Garfield and Dunsmuir streets. Hannaford Brothers, 232 Robinson street, have been awarded the plastering contract in an addition to the Bank of Montreal, James street south, to cost $6,000; E. B. Turnbull, 224 King street east, has been awarded the painting and glazing contracts; E. A. Work Company, John street north, has been awarded the electric wiring contract; Adam Clark Company, Main street west, have been awarded the heating and plumbing contracts; G. Kenneth Rea, 59 Beaver Hall Hill, Montreal, is the architect.

Saskatoon, Sask.—The Bank of British North America will erect a bank on Second avenue.

Winnipeg, Man.—The J. McDiarmid Company, Winnipeg, have been awarded the general contract for the erection of an office building for the Grain Growers' Guide, to cost $100,000.

CIVIL ENGINEERS.

Courtland, Ont.—The Sarnia Bridge Company, Sarnia, have been awarded the steel work contract on a bridge for the Middleton Township; A. L. Oatman, Tillsonburg, has been awarded the concrete work; R. Marston, C.E., Simcoe, is the engineer.

Peterboro, Ont.—The Quaker Oats Company contemplates the erection of a bridge across Dublin street.

Toronto, Ont.—The City of Toronto contemplates the erection of a bridge across the Rosedale Ravine at Glen road, to cost $200,000.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Galt, Ont.—The Board of Health contemplates the erection of an isolation hospital.

Guelph, Ont.—George E. Gringer Company, Wilson street, has been awarded the heating contract in a theatre for George Rheinhard, to cost $16,000; Colwill, Booth & Company, Union Bank Building, are the architects.

Hamilton, Ont.—P. H. Secord & Sons, Brantford, Ontario, have been awarded the general contract for the erection of a theatre for Marcus Loews Theatre Company, Toronto and New York, to cost $250,000, on King street; Thos. W. Lamb, 17 St. John street south, Montreal, is the architect. The Military Hospital Commission, 23 Victoria street, contemplates the erection of alterations to the hospital at Burlington Beach; Captain J. W. Symons is the architect.

Kingston, Ont.—The Hospital Commission contemplates the erection of a hospital to Queen's University.

Kitchener, Ont.—Work will commence in June on a hospital for the Sisters of Charity, to cost $90,000; A. W. Holmes, 10 Bloor street east, Toronto, is the architect.

London, Ont.—Architect Major Miller, Salvation Army, Toronto, is preparing plans for an addition to their hospital on Clarence street, to cost $10,000.

St. John, N.B.—The Deakin Construction, Montreal, have been awarded the general contract for the erection of an addition to the Algonquin Hotel, to cost $25,000.

Sudbury, Ont.—Architect P. J. O'Gorman, Sudbury, is preparing a sketch for an addition to the Balmoral Hotel.

Toronto, Ont.—The City of Toronto contemplates the erection of a hospital, to cost $75,000.

Toronto, Ont.—Frank Farrington Company, Detroit, Michigan, have been awarded the general contract for the erection of a moving picture theatre at the south-west corner of Richmond and Victoria streets, Toronto, to cost $150,000; Howard Crane, Detroit, is the architect; Hynes, Feldman & Watson, 105 Bond street, Toronto, are the associate architects.

FIRE LOSSES.

Amherst, N.S.—The Trenholm Block was destroyed by fire.

Aylmer, Ont.—A. W. Pierce flour and feed warehouse was destroyed by fire; loss $25,000.

Bathurst, N.B.—The Seminary of the Sacred Heart in West Bathurst was destroyed by fire; loss $150,000.

Belleville, Ont.—The plant of the Cordova Gold Mines, Limited, was destroyed by fire; loss $100,000.

Brockville, Ont.—The Canadian Carriage Company's factory at Brockville was destroyed by fire.

Canning, Ont.—The Canning Public School was destroyed by fire.

Collingwood, Ont.—Wilson Brothers, Limited, planing mills were destroyed by fire; loss $100,000.

Ford City, Ont.—The factory of Chalmers Motor Company, Ford City, was destroyed by fire; loss $250,000.

Galt, Ont.—The business block of A. E. Buchanan was destroyed by fire.

Gladstone, Man.—The plant of the Echo Milling Company was destroyed by fire; loss $115,000.

Highgate, Ont.—The church of the Methodist congregation at Highgate was destroyed by fire; loss $15,000.

Hope, B.C.—The Coquahalla Hotel was destroyed by fire.

Marmora, Ont.—Pearce Company, Limited, saw mill was destroyed by fire; loss $25,000.

Montreal, Que.—The plant of the Ingersoll Packing Company, St. Paul street, was destroyed by fire; loss $200,000.

Montreal, Que.—J. R. Walker & Company, Montreal, temporary premises were destroyed by fire; loss $10,000.

Montreal, Que.—The waste paper plant of J. R. Walker & Company, 11 Murray street, was destroyed by fire; loss $25,000.

Nelson, B.C.—The concentrating plant and building at the St. Eugene mine, operated by the Consolidated Mining and Smelting Company of Trail, was destroyed by fire.

Quebec, Que.—The building of the Le Soleil, a French newspaper, was destroyed by fire.

Bathwell, Ont.—The flour mill and elevator of Charles Clarke Estate was destroyed by fire.

St. John, N.B.—The stores of McRobbie Shoe Company, Ltd., and F. E. Homan Company were destroyed by fire; loss $20,000.

Stouffville, Ont.—The school of the Public School Board at Stouffville was destroyed by fire; loss $15,000.

Swift Current, Sask.—The Edmanson Block on Central avenue was destroyed by fire.

Thessalon, Ont.—The Masonic Lodge rooms were destroyed by fire; loss $6,000.

Thornbury, Ont.—The town of Thornbury skating rink was destroyed by fire; loss $5,000.

Toronto, Ont.—W. & D. Dineen, Yonge and Temperance streets, store building was destroyed by fire; loss $10,000. I. N. Devins boat house on the Humber Bay was destroyed by fire; loss $10,000.

Truro, Ont.—The Grand Central Hotel was destroyed by fire; loss $12,000.

Waterdown, Ont.—Roy Binkley hardware store and Wm. Seigel shoe store were destroyed by fire; loss $9,000.

Winnipeg, Man.—The elevators of the Northern Elevator Company at Winnipeg was destroyed by fire; loss between $200,000 and $250,000.

Winnipegosis, Man.—The store of the Armstrong Trading Company was destroyed by fire; loss between $50,000 and $75,000.

MISCELLANEOUS.

Barrie, Ont.—Plans are being prepared for a garage and bicycle shop for W. Urry, Barrie, to cost $10,000.

Beeton, Ont.—B. C. Henchan, Beeton, Ontario, has been awarded the general contract for the erection of a barn, stable and silo for the County House of Refuge, to cost $7,250.

Brantford, Ont.—Schultz Brothers Company, Albion street, have been awarded the general contract for the erection of an addition to the boiler house for the Water Commissioners, City Hall, to cost $5,500; W. C. Tilley, Brantford, is the architect.

Guelph, Ont.—S. Rundel & Son, Clark street, have been awarded the mason contract in a foundry for the International Malleable Iron Company, to cost $15,000; George Ibbotson, Woolwith street, has been awarded the carpenter contract; W. Cook 53 Quebec street west, has been awarded the painting and glazing contracts; The Canadian H. W. Johns-Manville Company, Toronto, have been awarded the roofing contract; F. and A. Howard have been awarded the galvanized iron contract; W. A. Mahoney, 73 Quebec street west, is the architect.

Hamilton, Ont.—The Canadian Steamship Lines, Limited, Montreal, contemplates the erection of a drydock and office building, to cost $250,000. Architect G. J. Hutton, Bank of Hamilton Building, is preparing plans for an addition to a garage and show rooms for the McLaughlin Motor Car Company, George and Bay streets, to cost $20,000.

Hamilton, Ont.—Addie Burke, 17 Mulberry street, contemplates the erection of amusement buildings at Burlington Beach, to cost $24,000. Thos. Hooper, Sun Life Building, has been awarded the general contract for the erection of a coal shed for Thos. Myles & Son, 8 James street north, to cost $10,000; J. Armes, Hamilton, is the architect.

Hamilton, Ont.—Canadian Engineering and Contracting Company, Bank of Hamilton Building, have been awarded the mason, concrete and carpenter contract in a pavilion for the Parks Board, City Hall, to cost $23,000; J. Riddell & Sons, 12 Ferguson avenue, have been awarded the sheet metal contract; Hannaford Brothers, 232 Robinson street, have been awarded the plastering contract; A. M. McKenzie, 45 Ferguson avenue, has been awarded the painting and glazing contracts; Adam Clark, 7 Main street west, has been awarded the plumbing contract; G. J. Hutton, Bank of Hamilton Building, is the architect.

Hespeler, Ont.—The Methodist Church contemplates the erection of drive sheds.

Kingston, Ont.—The Kingston Industrial Farm contemplates the erection of exhibit buildings.

Kingston, Ont.—The Salvation Army, Kingston, are excavating for a drill and recreation hall.

Kingston, Ont.—The Civic Utilities Commission of Kingston will erect a pump house and equipment, to cost $22,760.

Lindsay, Ont.—F. W. Moynes, Box 296, Lindsay, Ontario, contemplates the erection of a roller rink and dancing pavilion, to cost $15,000.

Lindsay, Ont.—R. Butler, Kent street, contemplates the erection of a garage on Kent street, to cost $6,000. Architect Harry Hickey, Lindsay, has prepared plans for a garage for H. E. Tripp & Son.

Lindsay, Ont.—The Norwood Engine Company of Canada, Limited, Sherbrooke, Quebec, have been awarded the filters and mechanical accessories contract in the waterworks equipment for the town of Lindsay; De Laval Company, Peterboro, Ontario, have been awarded the contract for the installation of turbine pumps.

London, Ont.—Henry Hayman, 848 Dufferin avenue, London, has commenced work on a bakery for C. J. Leach, 402 Princess avenue, London, to cost $5,000.

London, Ont.—Architects Watt & Blackwell, Bank of Toronto Building, London, Ontario, are preparing plans for a flour mill and grain elevator for Hunt Brothers, Talbot street south, to cost $100,000.

London, Ont.—The London Mausoleum Company contemplates the erection of a mausoleum at the Woodlawn Cemetery, to cost $100,000. Silverwoods, Limited, Bathurst street, London, are having plans prepared for stables, to cost $10,000. Architects Watt & Blackwell, Bank of Toronto Building, are preparing plans for a storage building for Hobbs Hardware Company, 335 Richmond street, to cost $10,000.

Montreal, Que.—S. M. Brookfield Company, Montreal, have been awarded the general contract for the erection of new vaults for the Eastern Trust Company.

Ottawa, Ont.—Gordon Law, 20 Sussex street north, will rebuild his machine shop, which was destroyed by fire.

Port Stanley, Ont.—The London and Point Stanley Railway Commission contemplates the erection of a grain elevator, to cost $100,000.

St. John, N.B.—The Fegles Bellows Engineering Company, Winnipeg, have been awarded the contract for the superstructure of an elevator for the Government.

Toronto, Ont.—W. & D. Dineen, 142 Yonge street, have commenced work on alteration to their store, which was destroyed by fire.

Toronto, Ont.—Geo. W. Richardson, 195 Adelaide street west, has been awarded the plumbing and heating contracts in the show rooms and garage for A. G. Strathy, 123 Simcoe street, to cost $8,500; D. C. Cotton, 54 Adelaide street east, is the architect.

Toronto, Ont.—F. W. Weale, 35 Lindsay avenue, has been awarded the mason contract in show rooms and garage for A. G. Strathy, 123 Simcoe street, to cost $8,500; Chas. Gallichan, 62 Dovercourt road, has been awarded the carpenter contract; D. C. Cotton, 54 Adelaide street east, is the architect.

Toronto, Ont.—Scott Brothers, 38 McGee street, Toronto, has been awarded the cut stone contract in a lodge building for the Masonic Temple Corporation of Toronto, Limited, to cost $175,000; A. Richmond, Yonge Street Arcade, has been awarded the concrete contract; Hoidge & Sons, 34 Price street, has been awarded the plastering contract; J. Gibson Marble and Granite Company, 52 Winchester street, have been awarded the marble contract; The Trussed Concrete Steel Company of Canada, Limited, Toronto, has been awarded the metal sash contract; Bennett & Wright, 72 Queen street east, have been awarded the plumbling, heating and electric wiring contracts; Otis-Fensom Company, 50 Bay street, have been awarded the elevator contract; W. F. Sparling & Company, Trust and Guarantee Building, is the architect.

Windsor, Ont.—The Rivena Farm Dairy, Sandwich street north, contemplates the erection of a dairy and creamery building.

Windsor, Ont.—Architects G. Jacques & Company, Windsor, Ontario, are preparing plans for a service station of the Studebaker Corporation, Walkerville, Ontario, to cost $30,000.

Windsor, Ont.—Architect J. C. Pennington, Labelle Building, is preparing plans for an addition to the machine shop of the Windsor Machine and Tool Company, Pitt street west, to cost $9,000.

Windsor, Ont.—R. Wescott & Company, Board of Trade Building, have been awarded the general contract for the erection of an addition to the machine shops of the Windsor Machine and Tool Company, to cost $9,000; J. C. Pennington, Labelle Building, is the architect.

PLANTS, FACTORIES AND WAREHOUSES.

Hamilton, Ont.—Architects McPhie & Kelly, Bank of Hamilton Building, are preparing plans for a factory for J. R. Moodie & Sons, Limited, King and Sanford streets.

Hamilton, Ont.—The Hamilton Bridge Company, Bay street, have been awarded the steel contract in a warehouse for C. Mills, 975 King street east, to cost $5,000; J. E. Riddell, 12 Ferguson avenue, has been awarded the roofing contract; Leek & Notts, 112 King street west, have been awarded the glazing contract; J. Mercer, 75 Barton street east, has been awarded the carpenter contract; H. C. Gummo, 15 Tuckett street, is the general contractor. Chas. Kidd, 152 Burris street, has been awarded the mason contract in a factory addition for the Furnival New Company, Cumberland avenue, to cost $5,000; Stuart Brothers, Hyde Park avenue, have been awarded the carpenter contract; J. J. Armstrong, 116 Burris street, has been awarded the concrete and sewers contract; The Hamilton Bridge Works, Hamilton, have been awarded the steel contract; Smith & Omand, 219 Ferguson avenue south, have been awarded the painting and glazing contracts; Adam Clark, 7 Main street west, has been awarded the plumbing contract; Arthur Stead, 148 Central avenue, has been awarded the cut stone contract; H. H. New, Spectator Building, is the architect.

London, Ont.—Architects Watt & Blackwell, Bank of Toronto Building, are preparing plans for an addition to the factory of Gorman, Eckert Company, 318 Rectory street, to cost $15,000.

Marmora, Ont.—The Pearce Company, Limited, will rebuild their saw and shingle mill, which was destroyed by fire.

Niagara Falls, Ont.—The Herbert Morris Crane and Hoist Company, Limited, 79 Peter street, Toronto, have purchased a site here for the erection of a factory on Stanley street, to cost $80,000.

Ottawa, Ont.—A company has been incorporated here entitled the International Shipbuilding Corporation, Limited, for the erection of a shipbuilding plant in New Brunswick.

Ottawa, Ont.—C. I. Stata, 303 Bell street, has commenced work on factory repairs for the Rolla L. Crain Company, Ltd., Spruce street, to cost $15,000; J. A. Ewart, Booth Building, is the architect.

Peterboro, Ont.—The Quaker Oats Company, Peterboro, will rebuild their factory, which was destroyed by fire.

Saskatoon, Sask.—T. Eaton Company, Limited, Toronto, will erect a mail order warehouse here, to cost $125,000. The Quaker Oats Company will erect a two-storey warehouse. The Ashdown Hardware Company will erect a warehouse, to cost $5,000.

Toronto, Ont.—J. A. Hamer, Credit road, Port Credit, Ontario, will erect a factory on Adelaide street west, to cost $9,000.

Toronto, Ont.—Architects Prack & Perrins, Lumsden Building, are preparing plans for a factory for the B. F. Johnson Soap Company, 155 George street.

Toronto, Ont.—Sheppard & Abbott, 78 Harbord street, have been awarded the plumbing and heating contracts in a factory for the Harry Webb Company, 23 Buchanan street, on Davenport road, to cost $40,000; J. Francis Brown, Board of Trade Building, is the architect.

Vermilion, Alta.—Glassford & Company are erecting a warehouse.

Winnipeg, Man.—The Paulin-Chambers Company will enlarge their factory.

Winnipeg, Man.—The Grain Growers' Grain Company have planned this year to build a lumber mill, to cost $150,000.

PUBLIC BUILDINGS AND STATIONS.

Ottawa, Ont.—The Ottawa Library Board contemplates the erection of a library, to cost $15,000.

Sydenham, Ont.—McLaren Lumber Company, Brockville, Ontario, has been awarded the general contract for the erection of a post office for the Department of Public Works, Ottawa, to cost $6,000.

Winnipeg, Man.—J. McDiarmid Company, Winnipeg, have been awarded the general contract for the completion of the new Parliament Buildings at Winnipeg.

RESIDENCES, STORES AND FLATS.

Brockville, Ont.—W. P. Driscoll and R. H. Smart, Brockville, are preparing plans for an apartment house, to cost $20,000.

Brockville, Ont.—T. J. Davison, Brockville, has been awarded the general contract for the erection of a store and apartments for C. B. Murray, to cost $6,000; A. S. Allaster, Brockville, is the architect.

Ford City, Ont.—Architect J. C. Pennington, Labelle Building, Windsor, is preparing plans for a store, dance hall and flats for F. Katzman, Ford City, to cost $5,000.

Guelph, Ont.—P. Martin, 61 Ann street, has been awarded the plastering contract in a residence for Alvar H. Simpson, to cost $6,500; Bennett & Bennett have been awarded the painting and glazing contracts; W. W. Stuart, Quebec street, has been awarded the electric wiring contract; W. A. Cowan, 149 London road, is the architect.

Hamilton, Ont.—Architect Gordon J. Hutton, Bank of Hamilton Building, is preparing plans for a residence for Peter D. Carse, 484 Main street east, to cost $15,000.

Hamilton, Ont.—Isbister Brothers, Hughson and Jackson streets, have been awarded the mason contract in a residence for Donaldson & Patterson, 229 Bay street, to cost $5,500; Alexander McKenzie, 164 Wentworth street, has been awarded the plastering contract. Architects Munro & Meade, Main and Hughson streets, are preparing plans for a residence for L. Donaldson, 229 Bay street, to cost $10,000.

London, Ont.—Architect W. G. Murray, Dominion Savings Building, is preparing plans for a residence for J. Miller, to cost $10,000.

Ottawa, Ont.—C. H. Statta, 209 Petoria street, has been awarded the general contract for the erection of apartments for Miss H. A. Clemow, 260 Banks street, to cost $26,000; Taylor & Harwood, Castle Building, are the architects.

Toronto, Ont.—B. Robinson, 491 Rushton road, has prepared plans for a residence on Northcliffe Boulevard, to cost $5,000.

Toronto, Ont.—Architect P. H. Finney, 79 Adelaide street east, is preparing plans for a pair of residences for W. A. Scott, 125 Mutual street, to cost $5,500.

Toronto, Ont.—Robert Brothers, 241 Dovercourt road, will erect an apartment house on the corner of Roxton and Arthur streets, to cost $60,000. Plans have been prepared for a store and apartments on Danforth and Cedarvale avenues, for J. T. Turner, 110 Dearborne avenue, to cost $9,000.

Toronto, Ont.—T. Purton & H. Chennells, 158 Ellesworth avenue, have been awarded the general contract for the erection of an apartment house for J. Henderson, 666 St. Clair avenue, to cost $20,000; P. H. Finney, 79 Adelaide street east, architect. R. Mowbray, 125 Alberta avenue, will erect a residence and garage on Regal road, to cost $5,000.

Toronto, Ont.—Plans have been prepared for a residence for J. M. Skelton, 85 Lawton avenue, to cost $5,000, on Heath street east. Excavation has commenced on three pairs of residences for A. & A. Grant, 837 Logan avenue, on Ellenbeck avenue, to cost $15,000. Excavation has commenced on a pair of residences for A. & A. Grant, 837 Logan avenue, on Fulton avenue, to cost $5,000.

Windsor, Ont.—C. H. Cunningham, 287 Ouellette street, is having plans prepared for a residence on Ouellette street, to cost $6,000.

Windsor, Ont.—Architect J. C. Pennington, Labelle Building, Windsor, is preparing plans for an addition to a residence for Gordon McGregor, Victoria avenue, to cost $6,000. R. Wescott & Company, Board of Trade Building, are excavating for a store for A. D. Bowlby, Sandwich street west, to cost $7,500.

Windsor, Ont.—J. McWilliams, 89 Walker road, Walkerville, Ontario, has been awarded the general contract for alterations to the flats of Fieldings & Son, Sandwich street east. John Milne, 34 Park street west, contemplates the erection of stores on Dougall street. D. Coutts, 70 Church street, has been awarded the general contract for the erection of a residence for L. C. Wetzel, Windsor, to cost $5,000.

Windsor, Ont.—E. Hanesworth, 79 Wyandotte street west, has been awarded the general contract and mason contract for the erection of a bungalow for S. Buchanan, to cost $5,000. Lambert & Braithwaite, 91 Caron street, have been awarded the carpenter contract; Windsor Hardware, Sandwich street east, have been awarded the sheet metal, steel, heating and plumbing contracts; Troupe Brothers, Gladstone avenue, have been awarded the plastering contract; Wm. Laesser, 91 Janette avenue, has been awarded the painting and glazing contracts; McNaughton-McKay, 216 Wyandotte east, have been awarded the electric wiring contract; J. C. Pennington, Labelle Building, Windsor, is the architect.

SCHOOLS, CHURCHES AND COLLEGES.

Barrie, Ont.—Architect F. S. Baker, Bank of Hamilton Building, Toronto, has prepared sketch plans for a collegiate, to cost $100,000, for the Board of Education.

Brantford, Ont.—Jesse Bartle, 172 Darling street, Brantford, has been awarded the general contract for the erection of an addition to a school on Erie avenue, to cost $9,000, for the School Section No. 23; F. C. Bodley, Colborne street, Brantford, is the architect.

Charlottetown, P.E.I.—Architects C. B. Chappel & Hunter, Charlottetown, will receive tenders up to Saturday, April 21st, 1917, for the completion of the interior of St. Teresa's Church, at Charlottetown.

Hamilton, Ont.—The Board of Education for the city of Hamilton contemplates the erection of a school, to cost $60,000. The Barton Township Council contemplates the erection of a school addition, to cost $10,000.

Kenora, Ont.—The St. Alban's Protestant Cathedral will rebuild their church, which was destroyed by fire.

Moserville, Ont.—Architect Chas. Knetchel, Glick Building, Kitchener, is preparing plans for a church for the Lutheran Congregation, to cost $12,000.

Sandwich West, Ont.—Wm. Murphy, Sandwich, Ontario, has been awarded the heating and plumbing contracts in a school for the School Board S. S. No. 1 Sandwich, to cost $8,890; A. Tourangeau, 14 Bridge avenue, Windsor, is the general contractor; G. Jacques & Company, Peninsular Security Building, Windsor, are the architects.

Ste. Perpetue, Que.—Thomas Caron, St. Aubert Company, Q'Islet, Quebec, have been awarded the general contract for the erection of an addition to a church for the Trustees of Ste. Perpetue, to cost $12,200; Pierre Levesque, 115 St. John street, Quebec, is the architect.

Stouffville, Ont.—The Public School Board have selected a site for the erection of a school, to cost $15,000.

Stoney Creek, Ont.—The Anglican Church of Stoney Creek contemplates the erection of a parish hall, to cost $7,000. The Methodist Church of Stoney Creek contemplates the erection of an addition to their Sunday school, to cost $10,000.

Trenton, Ont.—Architects S. B. Coon & Son, Excelsior Life Building, Toronto, are preparing plans for a school for the Public School Board, to cost $55,000.

PERSONAL.

Architects S. B. Coon & Son, Toronto, have removed their offices from the Ryrie Building to 810 Excelsior Life Building, Toronto, Ont.

DISSOLUTION OF PARTNERSHIP.

A change in the personnel of the firm of Curry & Sparling, architects, of 105 Bond street, Toronto, has recently taken place, necessitated by the retirement of Mr. Curry.

Mr. Wm. F. Sparling is now engaged in practice under the name of The William F. Sparling Company, Architects and Engineers, with a new suite of offices at 120 Bay street, in the new Trusts and Guarantee Building, which structure Mr. Sparling is completing. The entire office staff of the late partnership has been engaged, along with the services of competent engineers. The new firm are the architects for the new Masonic Temple being erected in Toronto. It is the intention of the company to establish New York offices to maintain their connection in the United States.

CATALOGUES and BOOKLETS

"Heating and Ventilation," by Louis Allen Harding, B.S., M.E., and Arthur Cutts Willard, S.B., is the title of an important new work for engineers and architects, comprising Volume 1 of what will be a series of volumes on "Mechanical Equipment of Buildings." The work, however, is complete in itself, while Vols. 2 and 3, now in preparation, will deal with power plants, elevator, lighting systems, refrigeration plants, sprinkler systems, vacuum cleaning and plumbing. In its scope and general treatment of the subject the volume on "Heating and Ventilation" easily takes rank with any of the previously-published works on the same general topic. In addition the authors have drawn freely on all available sources of information relating to this field of engineering, and have made extensive use of manufacturers' data in designing the various mechanical systems or plants required in modern buildings. In this respect alone, the work represents the latest and most approved practice. Moreover, the extensive training and experience of the authors have enabled them to select their data with a fine discrimination, so that the reader is really getting the accumulated notes, including much original matter, of these two engineers.

Among the many notable features of this work, special mention should be made of the number and uniform character of the illustrations, the great number of these, in many cases, requiring insert sheets to contain them all.

Unlike the ordinary manual on heating and ventilation, the volume devotes the opening chapter to physical units and measurement of heat, while the second chapter is given over to a consideration of the fundamentals of water, steam and air. The authors then take up modern heating practice in its various phases. A chapter is included on electrical heating, while another chapter gives a digest of the ventilation laws now in force. Air conditioning is given the place it deserves and central or district heating is adequately treated in a long chapter on the subject. The book contains no less than 615 pages, measuring 7 x 9¼ in. There are in all 543 illustrations. The book is handsomely bound in leather and sells for $4.00. Published by John Wiley & Sons, New York, and may be had through the book department of "Construction."

"Concrete Reinforcement Bars," published by the Burlington Steel Co., Ltd., Hamilton, Canada, is an illustrated booklet of thirty-two pages. The process used in manufacturing concrete reinforcing bars is described, and tables of physical properties and tests and methods of inspection are compiled in a concise manner. It also contains formulas of reinforced concrete beams, with an explanatory notation upon what assumptions the formulas are based.

Tables of the bending moments in foot pounds per foot of width of reinforced concrete slabs, and the weights and areas of square and round bars and weights in pounds of flat steel (one foot in length), are also offered in this book, which will be forwarded upon request.

Manufacturers' Inquiries.—The President of the Society was recently asked the following question by the advertising manager of a large manufacturing concern, says the Monthly Bulletin of the Illinois Society of Architects: "Why do not architects answer letters of inquiry from manufacturers?" The answer to the question was the statement:

"That every architect receives on an average of twenty letters per day, not accompanied by either a return post card or a stamped envelope, asking for information when there is work on the boards. Assuming that every architect was busy the entire time, it would mean that every architect would be expected to answer, say twenty letters of inquiry per day, or 6,000 per year, and as no letter can be written at a less cost than about 20 cents, counting postage, stationery, time and overhead, every architect would be expected to spend the sum of $1,200.00 per year in answering these inquiries if they were answered." Is further comment necessary?

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Stone, Wallace Sandstone Quarries, Ltd., Montreal, Que.
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Contractors, General, P. Lyall & Sons Construction Co., Ltd., Montreal, Que.
Architect, E. L. Harwood, Chief Architect Department of Public Works, Ottawa, Ont.

CONSTRUCTION

May, 1917 Vol. 10, No. 5

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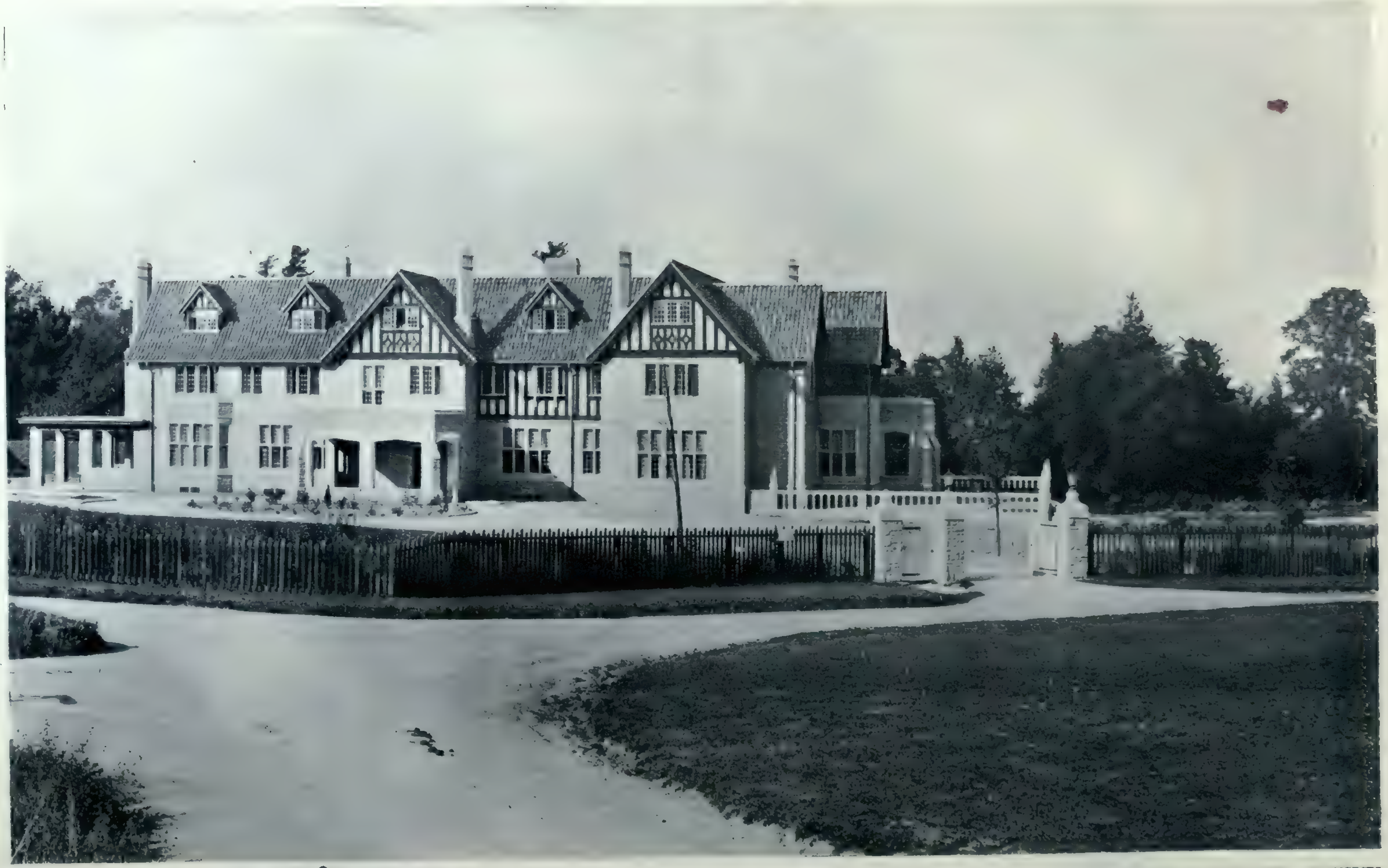


"STRATHROBYN," RESIDENCE OF F. B. ROBINS, RIDLEY PARK, TORONTO.

ALLAN GEORGE & MOORHOUSE, ARCHITECTS.

Modern Tendencies in House Building

Conclusions Drawn From a Study of Two Score House Designs in the "Architectural Review."

IN studying a group of two-score house designs it proves interesting and instructive to note certain general tendencies to be discovered by an analysis of the various houses. The prevailing "mode" seems to be for the living and dining room to adjoin each other, extending entirely along the southern front. Where this can be obtained without undue sacrifice of the remainder of the floor plan, it makes a cool and decidedly pleasant arrangement.

Decidedly less interest obtains in the plan combining the conventional central hallway extending through the house from north to south, with a living room opening on one side and the dining-room and service portion upon the other.

Comparatively few plans indicate any recognition of the fact that the best location for the living porch is toward the west. There are also a considerable number that ignore the opportunity or need to obtain morning sunlight in the dining-room and kitchen, thus securing a cooler outlook for these rooms for mid-day or late afternoon. There exists, of course, some difference of opinion as to whether morning sun in a bedroom is always desirable.

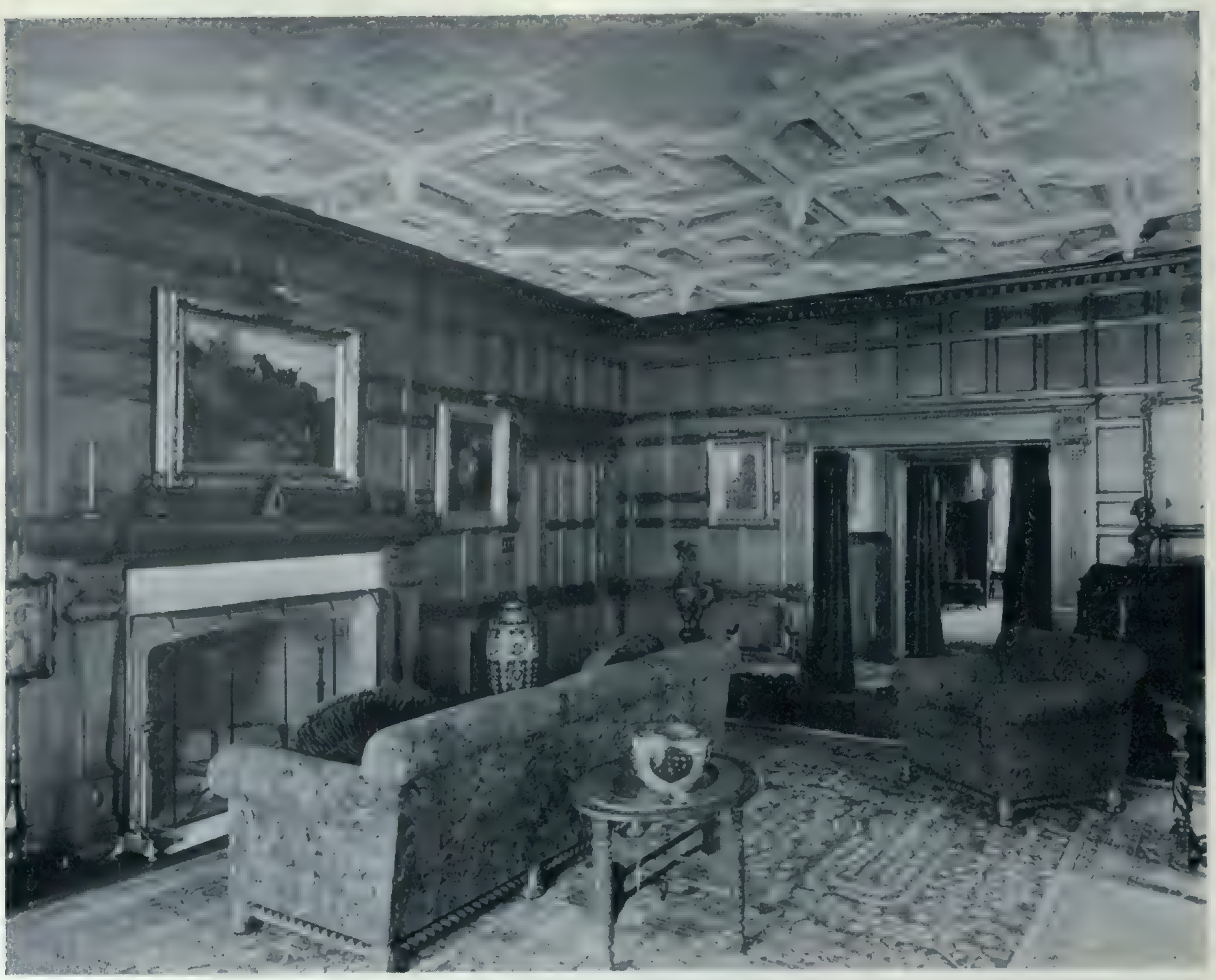
Many plans show a refreshing tendency towards a larger, more spacious and open hall, probably in justifiable reaction from the crowding of staircases and hallways imposed by clients demanding larger rooms than they can reasonably expect for the money they have available. This lack of space in the first storey hall is a regrettable defect found in most small modern houses. Nothing so adds dignity and hospitality to the dwelling as a carefully proportioned and gracious entrance hall.

It is also interesting to find so many of the houses that have, for their exterior treatment, some variation of the old Colonial *farmhouse* motive. This character has undoubtedly been avoided in recent years largely because most house-builders desire a more pretentious home than their investment justifies, and probably this new tendency somewhat snobbishly results from the fact that a few wealthy owners have more recently had the judgment and good taste to adopt this very type of house for their country or summer use.

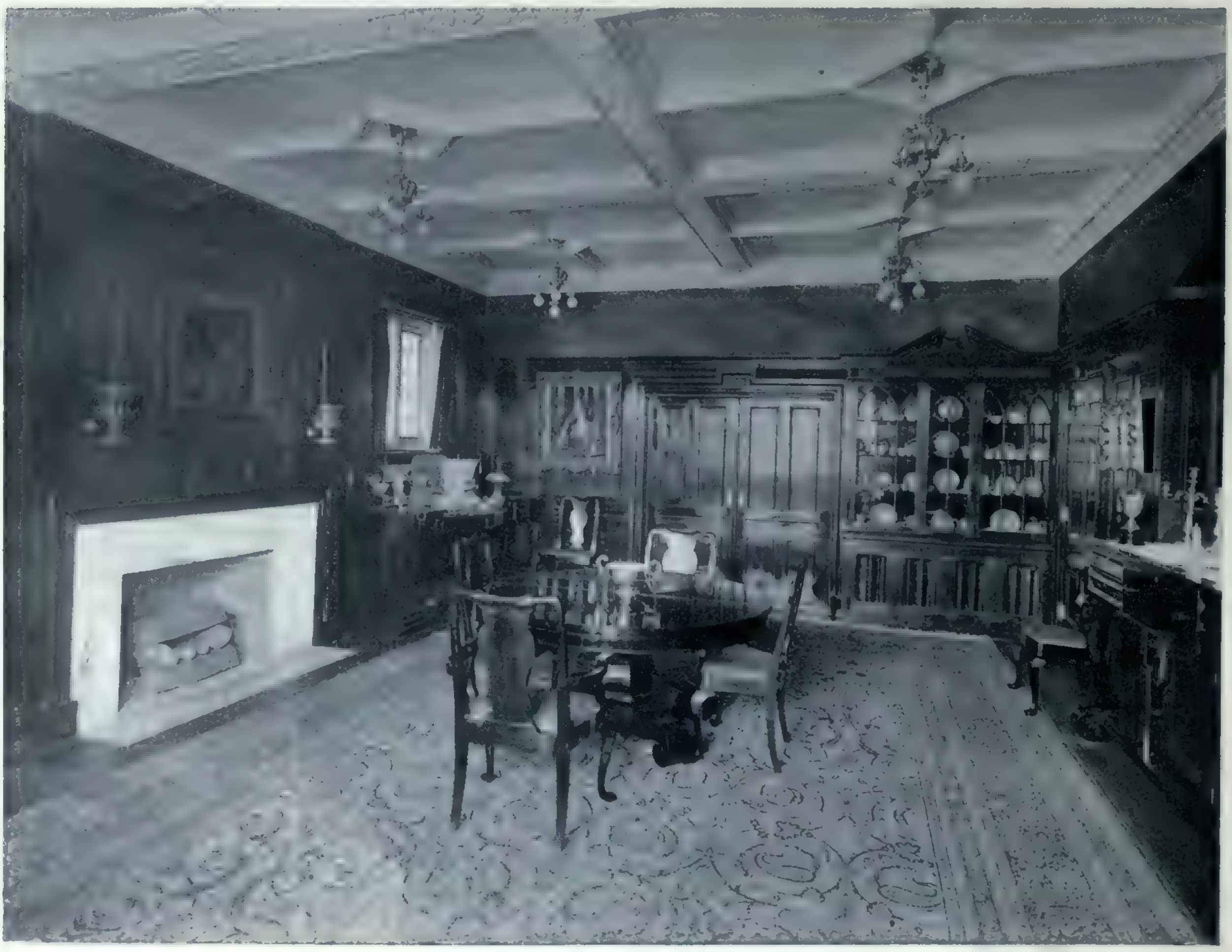
Judging from the drawings it is to the younger architect starting in practice, or the architectural draughtsman as yet unknown as an architect, that we must look for the most distinctive and most interesting low cost house designs. It is a regrettable fact that many architects—some even among those of established reputation—are content to conduct their business along lines that cannot help but produce in their work a sameness or monotony of effect. Many, without apology or pretense, continue intentionally to reproduce a particular type of house again and *again* and AGAIN, until their clients, making a circuit of adjacent suburbs, find their own homes repeated along almost identical lines a dozen—or more—times. Some clients there are who accept this as a subtle and delicate complimentary tribute, while others as violently protest. Suffice it to say that these architects soon become known, and this tendency noted, and that they probably do not impose upon their local public very long without being found out and very correctly numbered.

Other architects as unblushingly strive to base each new problem as nearly as possible upon some preceding plan, beginning to think along these lines as soon as the new commission begins to suggest or recall the old; and so the inevitable result is again a duplicate, not only of plan, but even, *quite* as probably, of elevation as well. The wildest and most daringly original idea ever entering their minds extends perhaps to the combination of an exterior of one house with the plan of another. This tendency, too, makes for monotony of appeal, besides a conventional and commonplace plan; and the architect practising either of these methods does little to maintain his responsibility to the community of giving of the best of himself, and treating each new problem so as to draw out the utmost of individuality and interest of which the surroundings—or the clients—are capable.

It is well for the beginner in his profession to remember that those architects who have made themselves finally and acknowledgedly successful, in *any* line of architectural work, have done so only because they have seized upon every opportunity to make the utmost individual and distinctive design out of each and every problem that came to them to be solved. While many clients may, in the first place, have very similar ideas for the plan of their home, it yet rarely happens that the type of plan they have in mind is entirely appropriate to the kind of lot they have selected, and no architect is true to his best self, or to his best ideals, if he does not seize upon every unusual element of plan arrangement—every extra complication of the problem imposed by plan or site—that provides opportunities for new and individual types of treatment, in even so hackneyed and universal a problem as a *home.*



THE LIVING ROOM AT "STRATHROBYN."



THE DINING ROOM AT "STRATHROBYN."

VIEW OF GROUNDS AND LODGE AT ENTRANCE TO "STRATHROBYN."

"Strathrobyn"--A Toronto Suburban Residence

A Country Home at Ridley Park With Many Interesting Features.

OF the modern residences recently erected in Canada that of Mr. F. B. Robins, located at Ridley Park, near Toronto, and named "Strathrobyn," is one of the most attractive and complete.

This house, which is essentially Tudor in design, is built on the edge of a wooded ravine, six miles north of Toronto. The lower storey is of Credit Valley sandstone, the upper storey hollow tile rough-casted. All the dressed work is of Indiana limestone.

The plan is simple. On the main floor is the hall, twenty-two by forty-four feet, with library and billiard room and main cloak room on the west, and living room, dining room and sunroom on the east. The paved loggia is approached from the dining room and the sunroom. The kitchen offices, butler's pantry, stillroom and servants' hall and verandah are to the north.

There are seventeen bed and dressing rooms, with six bathrooms, on the upper floors. The main hall and corridors have an oak dado, with stucco walls, above which forms a good background for the fine pictures. The dining room is panelled in mahogany, and has a ribbed plastered ceiling, with modelling in the beams, the frieze being lacquered. A fine portrait by Hoppner is framed into the over-mantel, among the other pictures in this room being a Sir Joshua Reynolds and a beautiful portrait by Beechey.

The living room is Jacobean, and is panelled in oak, with a decorated geometrical ceiling. This room is founded on the well known Bromley-by-Bow palace room, which is now in the Victoria and Albert Museum, London. The panelling forms an excellent background for the few beautiful and well-chosen pictures hung in the room.

The library and billiard rooms are trimmed in oak, all cases and billiard tables being in same wood.

The upstairs suites are finished in oak and mahogany.

The house is exceptionally well supplied with mantels, there being one in each suite and in each of the downstairs rooms and halls. Those in main hall, living room, dining room, library and billiard room are of brick, the design of each being different. All mantels are equipped for burning gas, but in a number log fires will be used.

All bathrooms have floors and high dado of tile and built-in solid porcelain tubs, with showers and pedestal basins. Steel recessed wall cabinets are in each room.

The lighting fixtures in all rooms were especially designed, and, as illustrations show, are very appropriate. The hardware is somewhat unusual and was specially made.

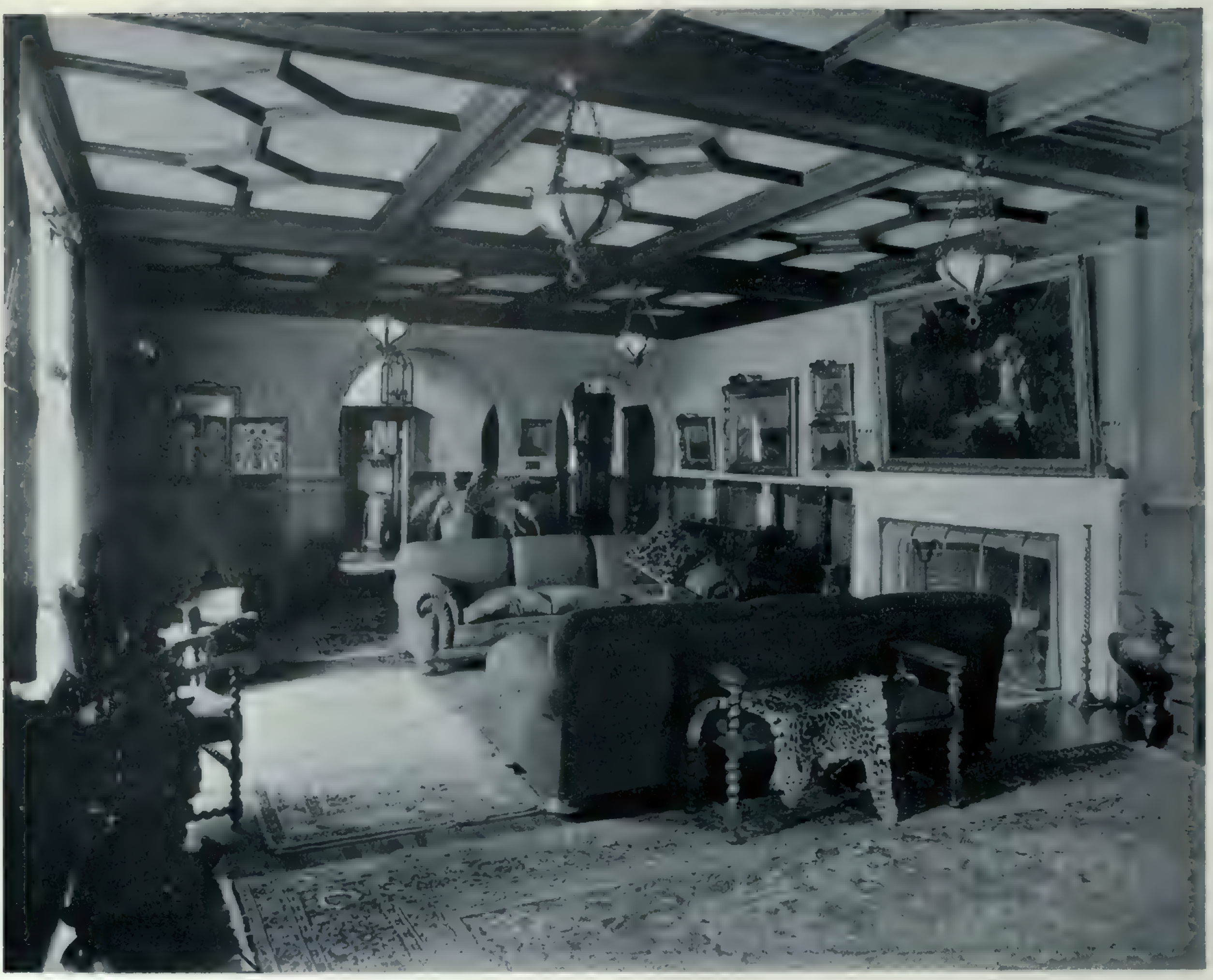
Steel casements are used throughout, the detail being the architects'. A stationary electric vacuum cleaner is installed in basement, with piping to every room and hall.

All rooms have telephones, connection being had between rooms or to Bell exchange through switchboard.

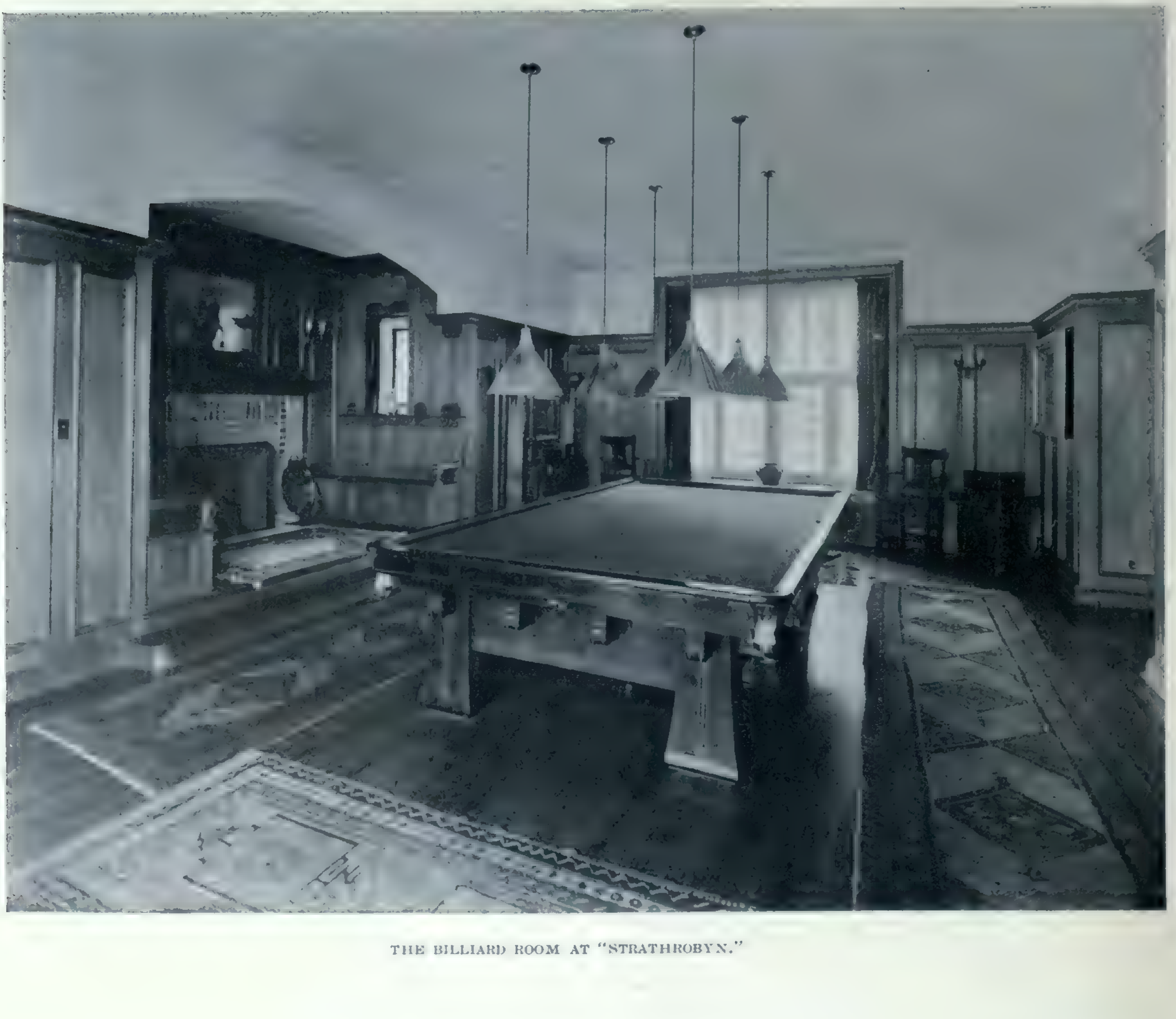
The house is heated by hot water, all radiation being concealed in base at windows, solid brass grilles being used.

The stone balustraded terrace on the east end is a great help to the house, the steps leading down to the formal garden, with its lily pond and pergoda. The tennis court and bowling green are beyond. The gardens were all designed in relation to the house, and a great part of the furniture was specially designed to suit the rather severe and simple treatment of the interior. The decorations and drapery show careful thought, and have been splendidly done.

Cottages, garage and stable buildings are a short distance from the house. These can be seen in the illustration heading this article. The principal buildings are arranged around a paved courtyard, after the English plan, the cow stables and kennels being at back, with chicken houses and runs behind garage. Each cottage has six rooms, bath and laundry. All external walls are of hollow tile, roughcasted, the roof being brown-stained shingles. Allan George & Moorhouse, Toronto, architects.



THE SPACIOUS HALL AT "STRATHROBYN."



THE BILLIARD ROOM AT "STRATHROBYN."

THE PICTURE AND ITS SETTING

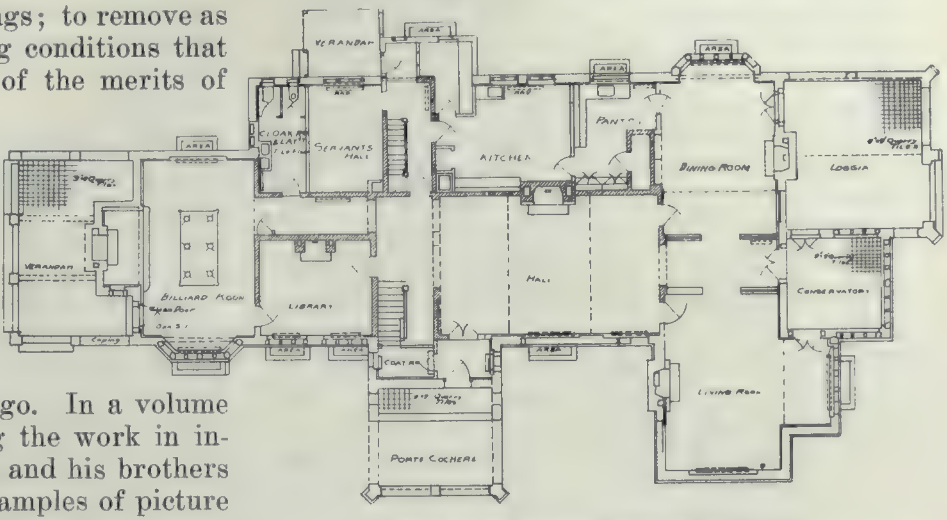
No amount of embellishment, or applied ornament, can redeem a structure faulty in its proportions, and in like manner the most expensive of picture frames cannot transform bad art into good.

The true function of a frame is to "cut in" the picture from its surroundings; to remove as far as possible any distracting conditions that prevent perfect appreciation of the merits of the picture. It is therefore quite evident that any frame that is so assertive as to contend with the picture is the height of bad taste.

For examples of good style in frames, we may refer back to a period of an hundred years and more ago. In a volume recently published illustrating the work in interior design of Robert Adam and his brothers there are to be found many examples of picture framing. In every instance, these frames are simple, mitred moldings, often forming wall panels in which the pictures are placed. They serve their purpose artistically, and are therefore in good taste. It will be further noted that the moldings are of the same type as those that form the paneling of the room, and this fact brings us to the discussion of a very frequent lapse in modern picture framing methods.

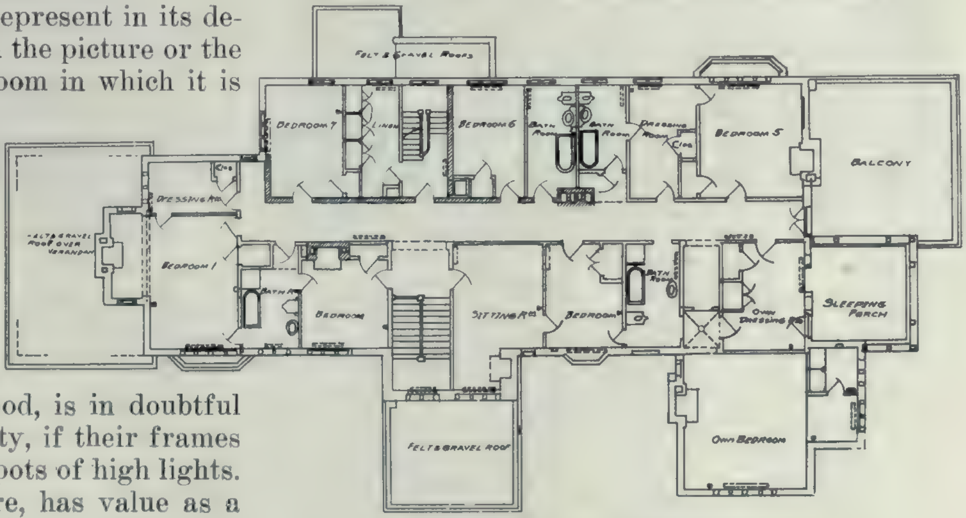
Too often does the frame represent in its design a period at variance with the picture or the decorative treament of the room in which it is hung. There are Watteau landscapes in Rococo frames, etchings of Greek and Roman temples in Empire frames and all the inconsistencies that bad taste can suggest. In fact, in the more formal rooms of the house a predominance of pictures, even if good, is in doubtful taste, and borders on vulgarity, if their frames are assertive of gilding and spots of high lights. If a picture is a good picture, has value as a work of art, it can be framed in a molding bordered panel and become a part of the decorative treatment of the room in which it is hung.

Artists will be very often heard to remark that a picture "fights" its frame or that two pictures, placed side by side, "fight" one another. The latter is more often the case when pictures in different media are placed in the same room. It is of course a violation of good taste to hang oils and water-colors in the same room, or to mix on the walls etchings and photographs. Oil painting, the most dignified expression of art, should find its place in the drawing room, the water-colors belong to bed chambers, the morning room or the boudoir. Etchings and other black and white pictures are properly placed in the living hall, the library and dining room. The many photographs and portraits are for the den, and the private bedrooms.



FIRST FLOOR PLAN OF "STRATHROBYN."

Something must be said as to backgrounds. A gilt frame on a gilt wall paper or background is not always in good taste, and it is safer, of course, if the pictures are of sufficient value, to make them important parts of the decorative scheme, that a background of some neutral color, such as will be found in all galleries, should be provided. Oils, of course, should be framed in gold, but there is the exception sometimes of a decidedly "gray" picture, which can be framed in a "dead" black frame with a narrow gold inset next to the canvas.



SECOND FLOOR PLAN OF "STRATHROBYN."

The custom of framing etchings with a wide white border all around and a narrow black frame, is one to be avoided.

A further error is the placing of "black and white" pictures on a yellow wall or background. The yellow will so accent the black of the pictures as to set up a blurring effect, and no matter how good the etchings may be, their value will be destroyed by such sharp contrasts.

Modern Conservatories and Greenhouses

An Increasingly Popular Feature in City Homes, Hospitals and Hotels.

ILLUSTRATED herewith are a plan and an exterior view of the glass garden which is an important addition to "Strathrobyn," the structure consisting of a palm house, two greenhouses and a workroom.

The beauty of the estate is greatly enhanced by the linking up of the conservatory to the residence, while there are also many advantages to be enjoyed as a result of having a supply of hothouse production available in the home at all times.

Architects are, however, beginning to realize that a greenhouse or conservatory is a very desirable addition to a well-planned modern home, and few are the plans prepared that do not include a greenhouse or allow for its erection at some future date.

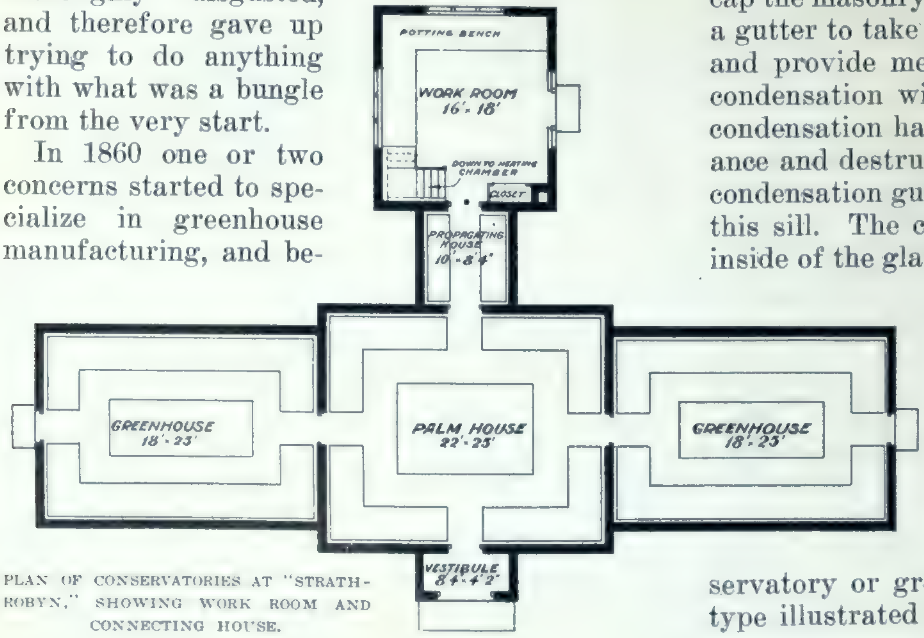
Greenhouses can also be used to good advantage at hospitals or similar institutions. Besides being useful for supplying plants and flowers for beautifying the building and grounds, they can be run at a profit by the sale of flowers to visitors for the patients.

Hotel owners are also beginning to see the advantages of having a greenhouse connected with the hotel. Under the care of an expert gardener the hotel is thus supplied with all kinds of vegetables out of season, as well as cut flowers and plants for decorating purposes.

Greenhouse construction started out in a very crude way, and continued in its crudeness for many years. The houses were built all sizes and shapes. Good design was never given a thought, and the essentials of plant life were forgotten.

As a rule these houses were soon in a leaky and tumble-down condition, and the owners were thoroughly disgusted, and therefore gave up trying to do anything with what was a bungle from the very start.

In 1860 one or two concerns started to specialize in greenhouse manufacturing, and before long a noticeable improvement was made in the construction. Later, when concrete and steel became popular in buildings of all descriptions, it was only natural that they should be used for constructing greenhouses. As the steel members can be made much stronger and lighter than it was possible out of wood, the greenhouse of to-day is much more satisfactory for growing purposes, as well as more durable.



PLAN OF CONSERVATORIES AT "STRATHROBYN," SHOWING WORK ROOM AND CONNECTING HOUSE.

When the greenhouse manufacturer had improved the mechanical construction of the house and met the requirements of plant life, he began to think of improving the design. He realized that if his product was to become popular it must be made to harmonize with the other buildings it was to be linked-up to, for at this stage of cultivation the mind revolts at a mere crude utility.

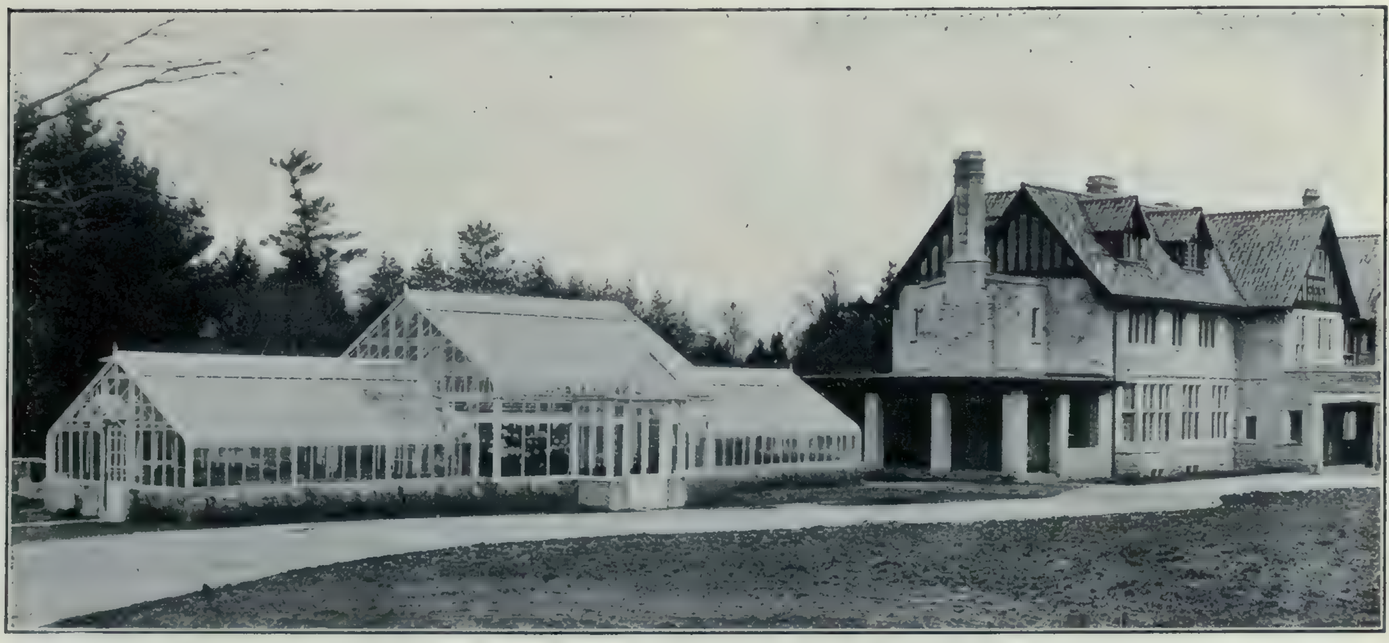
About ten years ago the curved eave house was introduced, and it has become very popular on account of the great improvement it made over the old angle eave house. The curved eave is formed by bending a flat iron rafter at the eave, and as this rafter is continuous from the ridge to the sill, it is possible to do the glazing with the aid of very light wooden members. This does away with the heavy objectionable wooden members that were formerly used. This flat iron rafter also makes it possible to construct palm houses that will please the particular architect, and at the same time give the required light.

Some of the details that helped to make the modern greenhouse complete are worth notice. The combination sill and gutter was designed to cap the masonry wall, and at the same time form a gutter to take care of the water from the roof and provide means of collecting the water of condensation within the house. The water of condensation has been a great source of annoyance and destruction, and to take care of this a condensation gutter was formed on the inside of this sill. The condensation takes place on the inside of the glass. It flows down the glass, and also the drip gutters provided in the roof bars, and is collected in the condensation gutter. The manner in which the rain and water of condensation is conducted to the drain is clearly shown in the drawing.

The ventilating of the conservatory or greenhouse is important. In the type illustrated the practice is to run two continuous lines of vent sash, one on each side of the ridge. These sash are split up in sections if the house has more than one compartment, so that the air can be controlled according to the requirements of the plants in the different compartments.

Palm houses usually have side ventilation in addition, although it is not necessary for growing purposes. The sash are hinged to the ridge by galvanized hinges. The top is fitted under the ridge cap, and thus forms a water-tight joint. The bottom of the sash seats on the vent header. The vent header is moulded to receive the water of condensation from the under side of the vent sash, and by means of outlets cut into the vent header this water is carried out on the roof, thus preventing any drip within the house at this point.

The heating of the greenhouse is most important, as on it depends the success or failure of the entire plant. Unlike the heating of the residence the pipe coils are horizontal instead of vertical. This makes it more difficult to get the rapid circulation that is necessary for an efficient greenhouse heating system. Then again, the different compartments of a greenhouse require temperatures that vary from fifty to eighty-five degrees when the outside temperature is ten to twenty degrees below zero. It is impossible to go into all details of greenhouse heating here, but the reader will realize that greenhouse heating problems can be solved best by the greenhouse manufacturer. He has had years of experience, and has been up against the problems. He also knows the different temperatures required by the flowers.



CONSERVATORIES AT "STRATHROBYN." ERECTED BY GLASS GARDEN BUILDERS.

There are numerous other details and difficulties the greenhouse manufacturer has to overcome in order to place on the market a house that is efficient, durable and pleasing in design, and although there is still room for improvement, it seems that the greenhouse manufacturer is more than holding his own in this commercial age, when the world-wide slogan in manufacturing is perfection.

◆

BRITISH COLUMBIA LUMBER CUT

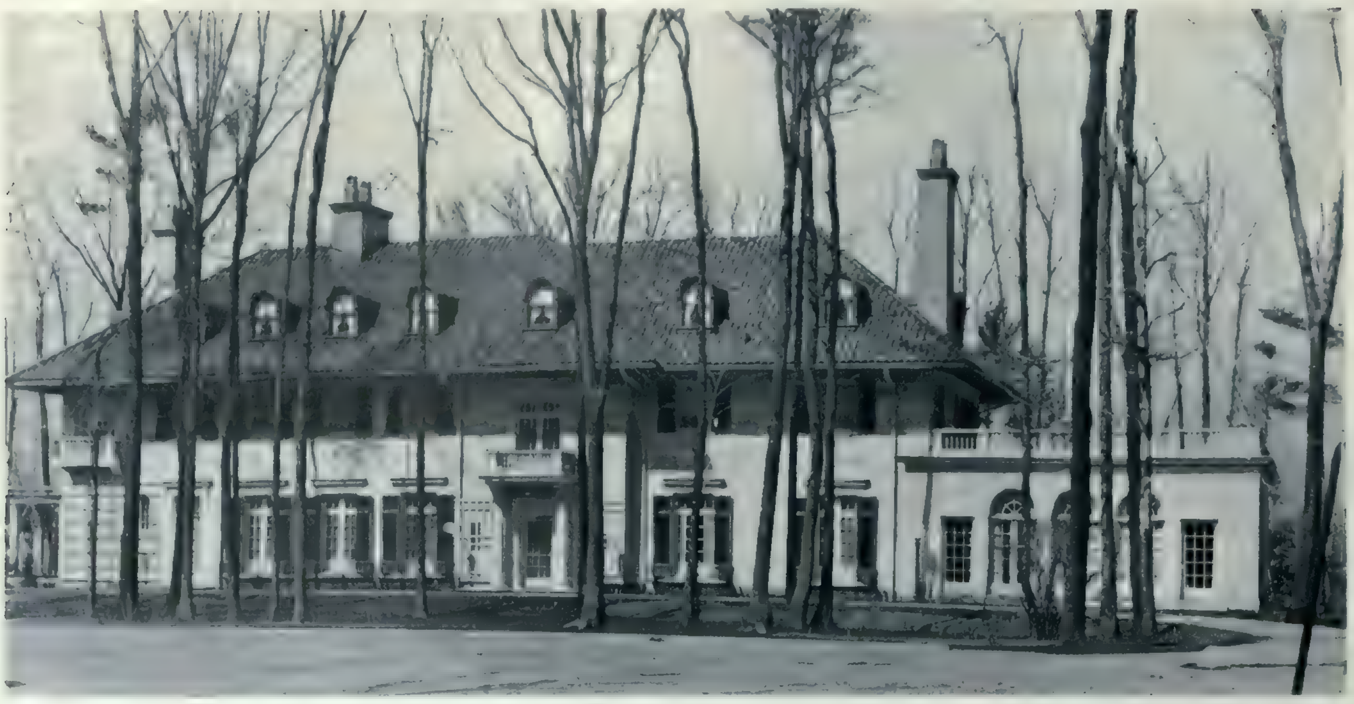
The value of the lumber cut for the Province of British Columbia in 1916 will show an increase over that of the previous year, when the value was put at $29,150,000. The demand for lumber during the last year showed an improvement, and prices generally were higher. The best previous year was 1913, when the value of the cut was $33,500,000. It is predicted that this year's value will be well up to this latter figure.

A feature of last year's lumber business has been the increase in shipments to Ontario, where an aggressive campaign has been carried on to popularize the British Columbia product. The demand has resulted in doubling shipments to Ontario for floorings, paneling, mouldings, etc.

◆

NEW FLOORING MEASUREMENT

The last few months have seen the gradual deposition of the "customary square" as the unit for selling floorings and matchings and the establishment of the "hundred superficial feet" in its place. Among English merchants, where once the old-fashioned, irregular, and illogical customary square was universal, the alternative measure has been recognized; and among the price lists recently issued by London, England, importers, a substantial proportion have adopted the new measure.



RESIDENCE OF RALPH CONNABLE, TORONTO. WICKSON & GREGG, ARCHITECTS.

A ROOMY TORONTO RESIDENCE

The residence of Mr. Ralph Connable, Melgund avenue, Toronto, is built of hollow tile construction, stucco finish, and the roof is covered with Spanish tiles in six tones of green to give a slight variation in color. At the rear of the house is a broad terrace overlooking the ravine, and in the centre of the terrace is a large basin fountain. The garage and chauffeur's apartments are built to correspond in design with the house and located at the south-east corner of the lot with separate driveway from the street. Between the house and the garage is the rose garden and tennis court, the latter surrounded with specially designed wire railing.

As will be noted by the plans, all the rooms on the first floor are en suite. The main halls and vestibule, and all the main bedrooms, are finished in whitewood, enamelled white, and the dining, living, billiard and sun rooms are in quarter-cut white oak.

Special attention has been given to the decorations. On the exterior, the soffit of the main cornice, which is panelled between the brackets, is painted in rich shades of red, blue and grey, giving a fine effect in contrast with the white plaster.

The decoration of the living and dining rooms was entrusted to the New York artist, A. Lincoln Cooper. In the living room the ceiling was coffered, and the work was carried out in soft shades of grey and rose, the coffers being enriched with Italian figure groups.

Wickson & Gregg, Toronto, were the architects.

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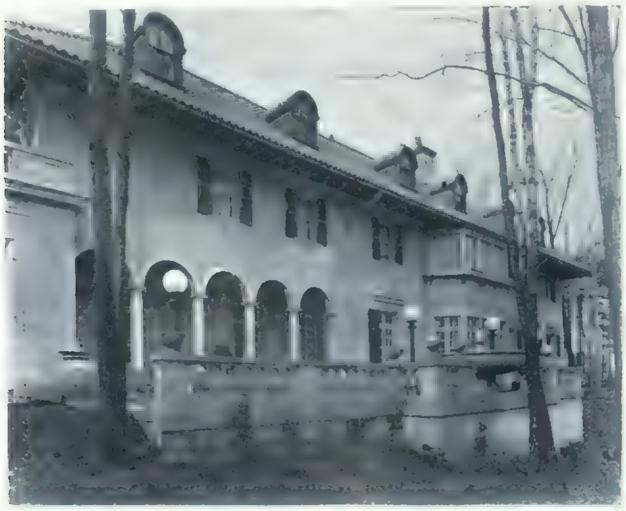
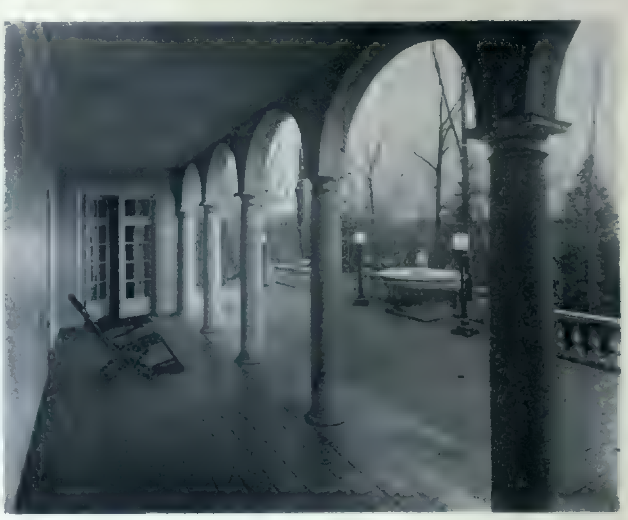
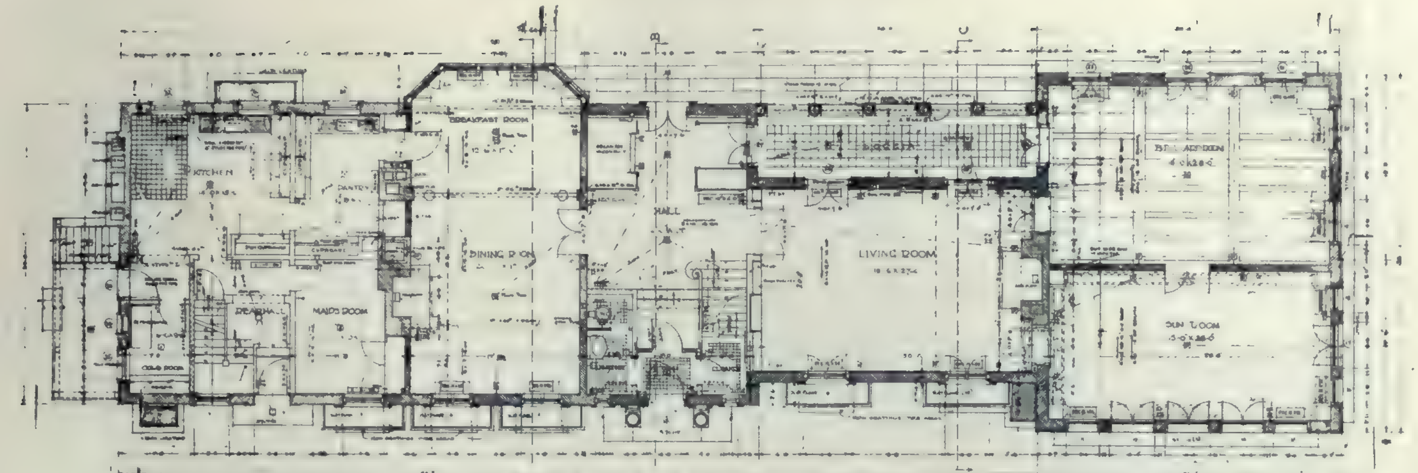
The highest chimney in the world was completed last January in Saganoseki, Japan. It is of reinforced concrete construction, 570 feet high, 42 feet 8 inches outside diameter at the bottom, and 26 feet 3 inches inside diameter at the top, with a thickness of 29½ inches at the bottom and 7 inches at the top.



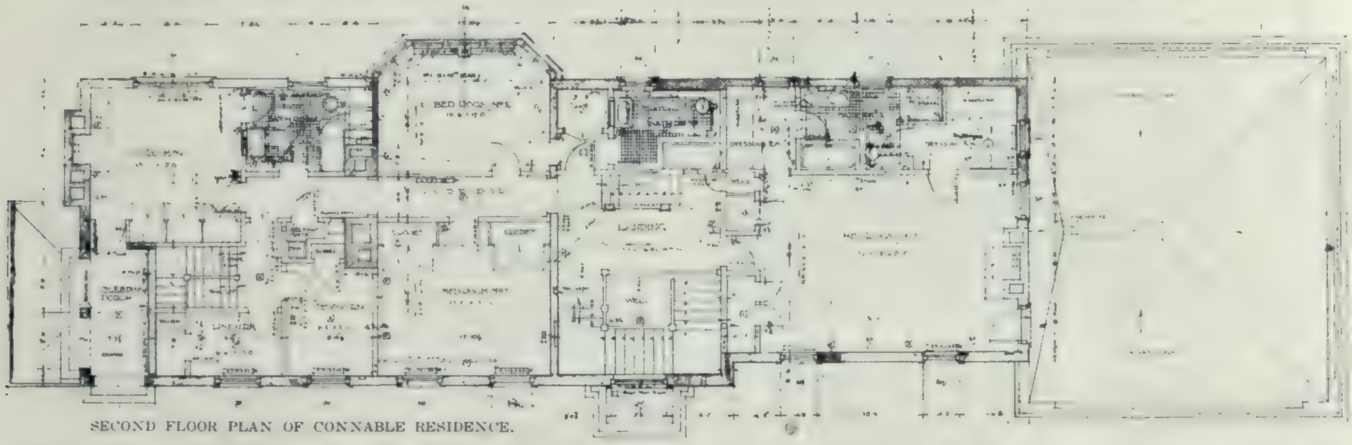
REAR ELEVATION OF CONNABLE RESIDENCE.



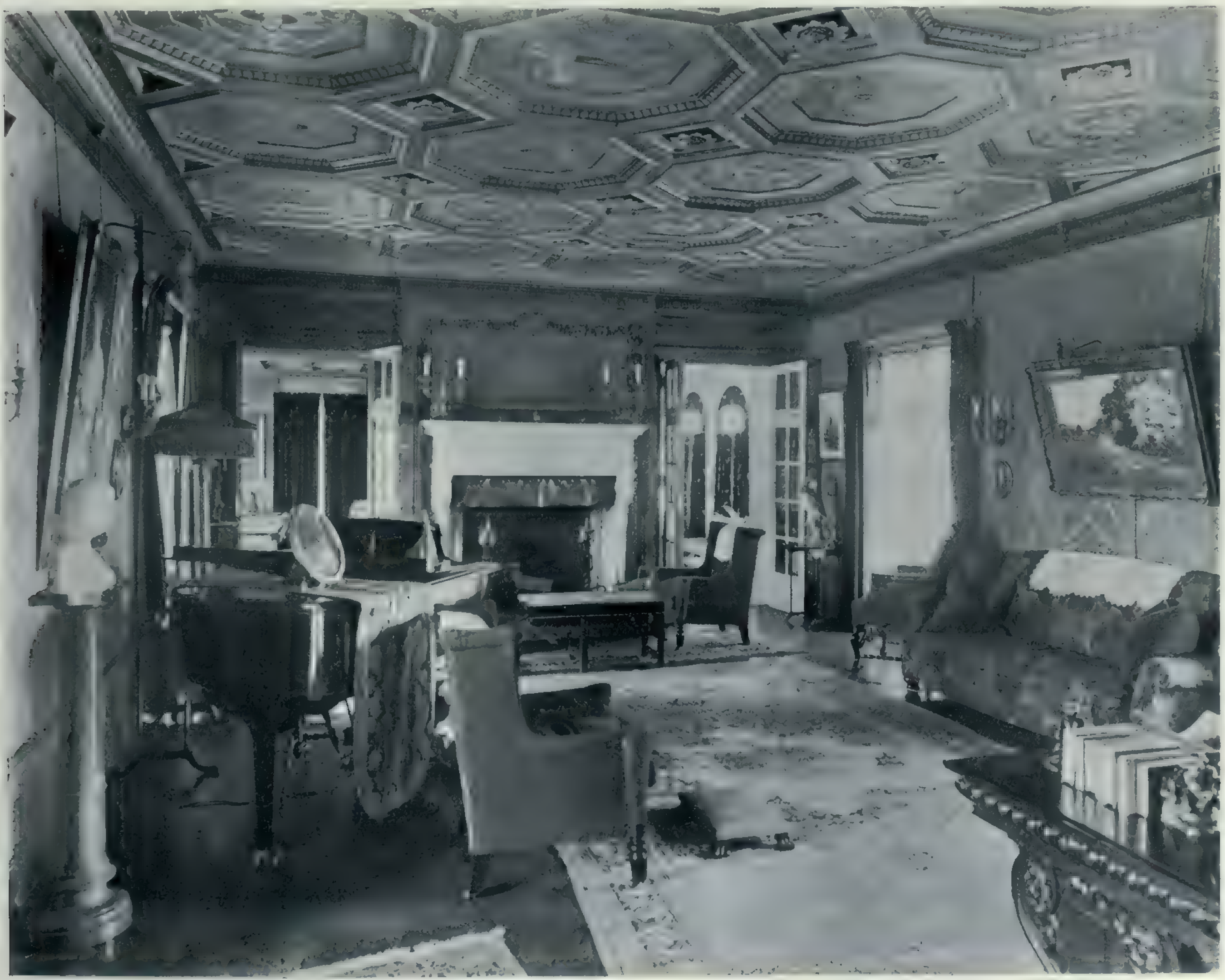
TERRACE AND BASIN FOUNTAIN OF CONNABLE RESIDENCE.



FIRST FLOOR PLAN OF CONNABLE RESIDENCE.



SECOND FLOOR PLAN OF CONNABLE RESIDENCE.

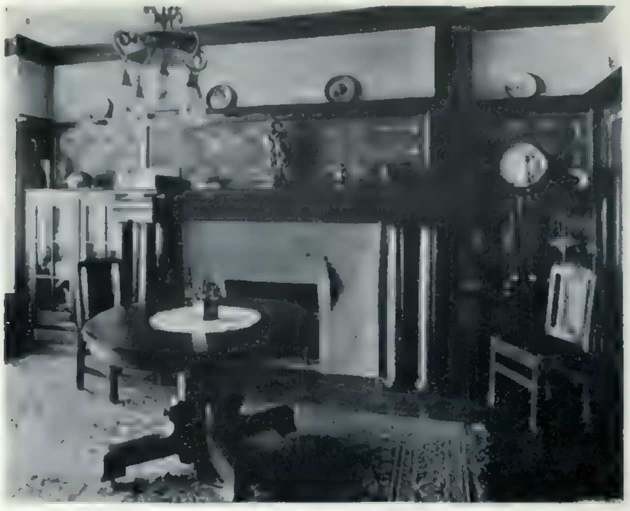


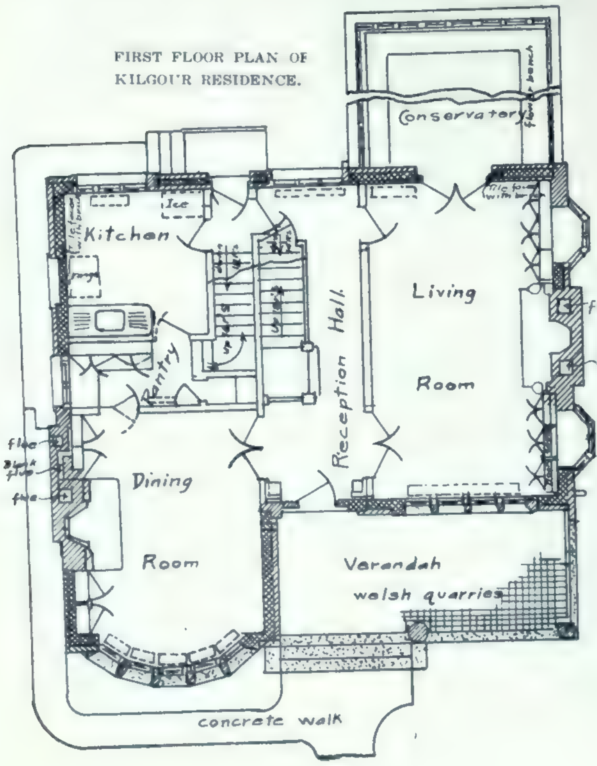
LIVING ROOM OF CONNABLE RESIDENCE.

A COMFORTABLE TORONTO HOME

Well terraced above the street, at No. 7 High Park Gardens, Toronto, is the very homey little residence of Mr. R. D. Kilgour. Its mullioned casement windows, huge chimneys and roof, carried down over the verandah, are reminiscent of Stratford-on-Avon, while the returning of the roof and cornice through the gables adds unity to the design, and displays the Spanish tile roof. The feeling of solidity is enhanced by the deep revels, the brick gable walls above the cornice setting back one-half brick from the walls below, and the heavy chimneys supporting and balancing the high gables.

Tapestry or corduroy brick, with deep raked joints, above narrow rock-faced ashler basement walls, with moulded stone mullions and transoms, stone verandah columns and balusters, Welsh quarry verandah floor and tile roof, all contribute to a feeling of strength and consistency, while the two-storey front bay and the oriel windows nestling snug under the wide cornices add the necessary domestic touches.


DINING ROOM OF KILGOUR RESIDENCE.


FIRST FLOOR PLAN OF KILGOUR RESIDENCE.

The spacious well-lighted rooms are beautifully decorated, the trim being delicate and finished with panelled base in living room and first floor hall. Consistency of design and careful working to details are everywhere in evidence. The living room is finished in mahogany with large tiled mantel, built in bookcases, and strapped walls above the panelled base.

The dado cap runs over the doors, and a light spreading cornice against the stucco ceiling gives the finishing touch to a simple yet rich room.

The dining room is treated similarly in quarter-cut white oak, with brick mantel, having Doric columns and bracketed cornice and built-in china cabinets on either side of the mantel. A wide plate rail with moulded brackets replaces the dado cap of the living room.

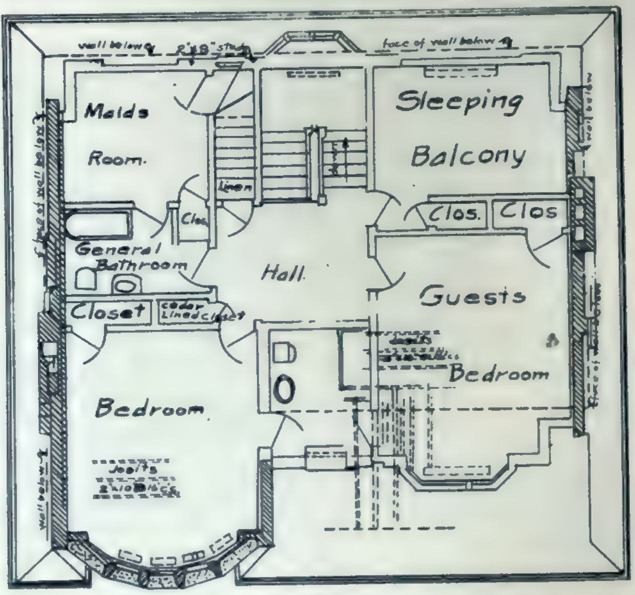
The hall has a rather unique treatment in a low panelled base in white enamel, with straps of same at all corners and at cornices. The newels, balustrades and treads of the stairs are mahogany, which, with a mahogany cap over the low white panelled base, relieves the otherwise white treatment.

On the second floor the white enamel trim is relieved by mahogany doors. The maids' room is finished in natural cypress, which continues down the back stairs and through the kitchen.

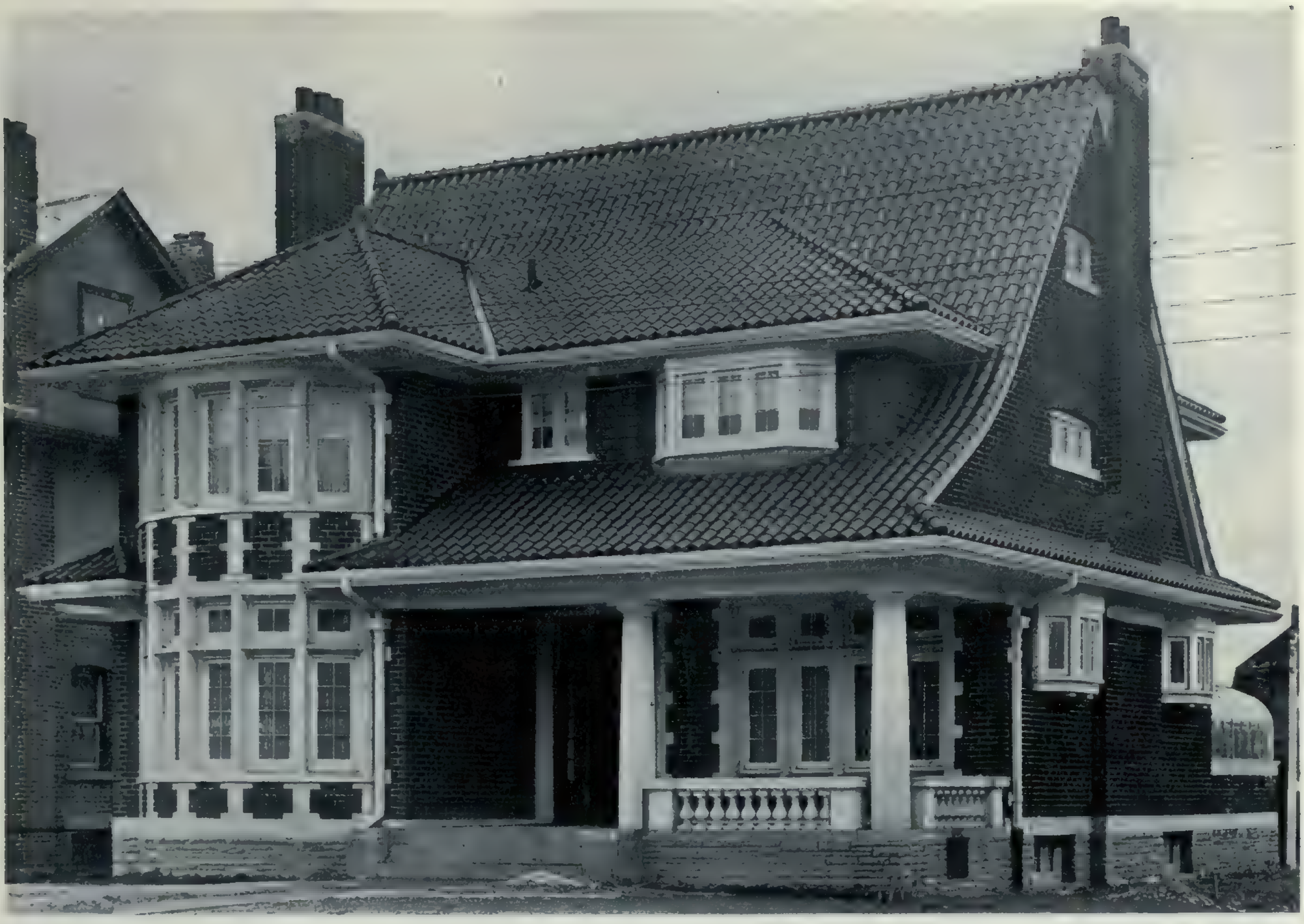
The pantry is finished in quarter-cut oak to match the dining room. The floors throughout the house are of this wood also.

The bath fixtures are solid English vitrolite ware, including built-in corner tub and pedestal basin.

A No. 6½ boiler serves square, plain top, low rads, and angle rads, in all bays. Concrete tubs are installed in the laundry, which is plastered. The billiard room has pressed brick walls, birch floors, oak trim and brick mantel, and has an oak stairway from first floor hall. Toilet facilities are provided in basement.



SECOND FLOOR PLAN OF KILGOUR RESIDENCE.



RESIDENCE OF R. D KILGOUR, TORONTO. J. A. M'KENZIE, ARCHITECT.

BUNGALOW OF UNUSUAL DESIGN

The architects in accomplishing their purposes to suit the tastes of the owner in the Neilson home (illustrated) have departed somewhat from the stereotyped form of bungalow, and in their treatment of the roof and general front elevation show originality and taste in design which is not apparent in the ordinary house.

The exterior of this home is composed of cut stone, with smooth stucco upper, the chimneys being carried to a good height and capped with ornamental cut stone. A feature of the roof is the abnormal height in the bungalow style, but this to some extent is relieved by the acute angle and the treatment of the dormer in front.

The sparing introduction of the wrought iron supports to the eavetroughing, well designed and correctly placed, is also good as applied to this exterior, and the idea is to be found further in the turned wood columns which support the roof from each stone pillar and tend to give a finished appearance, while the grouping of the dormer windows carries out the general symmetrical design of the whole front elevation. The heavier turned supports tend to bear out the general idea of the semi-bungalow.

The verandah, with its one terrace of stone steps, gives an air of seclusion. The visitor will be impressed with the verandah and motor driveway at the end providing a sheltered entrance to or from the motor car. A feature that has been carried throughout the house are the glass panelled French doors which greet you as you ascend the verandah steps. The general and commendable restraint shown in all the rooms is nowhere more noticeable than in the living room, with its view of the conservatory adjoining. Panelled walls carried to a good height, with straight ceilings and moulded cornice, give an air of quiet refinement. The stone mantel and plain shelf, with two supports, carry out the general idea, while the hearth, with its large square red tiles, tends to break to a certain extent the heaviness of the stone work in the mantel. The usual beamed ceiling in this room is particularly conspicuous by its absence.

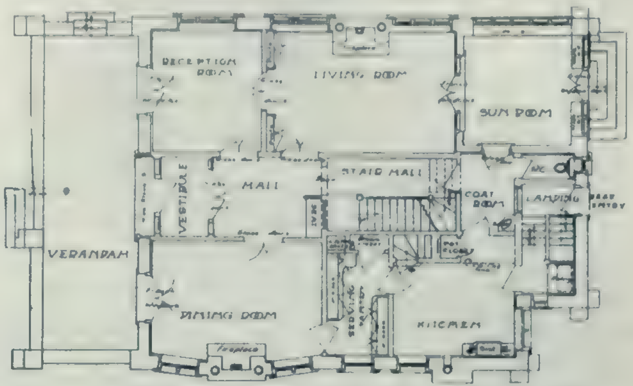
The oaken floor is covered by a Persian rug.

LIVING ROOM OF KILGOUR RESIDENCE.

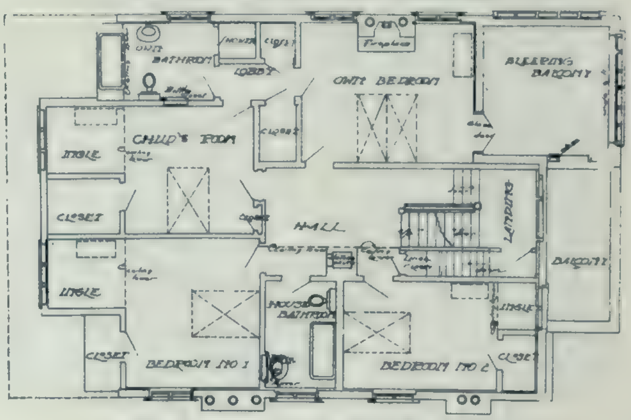
LIVING ROOM OF NEILSON RESIDENCE.

The sunroom is inviting and well lighted, leading into the garden. The economy of space is apparent in a survey of the ground floor plan. There is no waste space in halls. The dining room with fire place is located in the front of the house, while the kitchen and butler's pantry are conveniently located, but isolated from the main entrance.

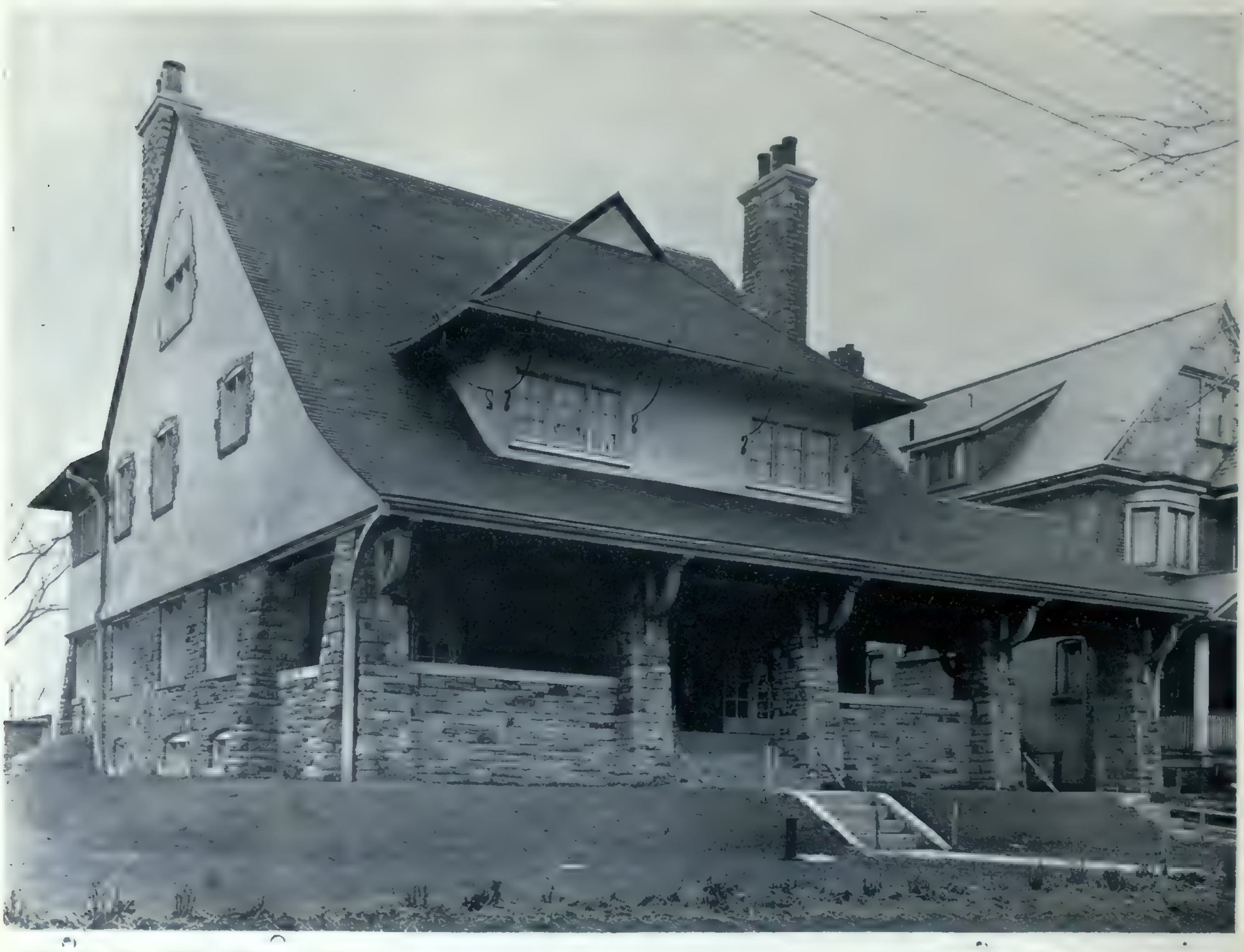
The stairs have easy treads, and lead up through a small stair well to a well-planned square hall. All rooms lead off the hall. The owner's room and child's room are provided with shower baths. There are five spacious bedrooms on this floor, together with a sunroom. Large linen closets in every room are a feature.



FIRST FLOOR PLAN, NEILSON RESIDENCE.



SECOND FLOOR PLAN, NEILSON RESIDENCE.



RESIDENCE OF MORDEN NEILSON, TORONTO.

CHADWICK & BECKETT, ARCHITECTS.

The Practice of Garden Design

By H. B. DUNINGTON-GRUBB

"And a man shall ever see, that when ages grow to Civility and Elegancy, men come to build stately, sooner than to garden finely; as if gardening were the Greater Perfection."

AFTER more than three centuries have rolled by the truth of Bacon's words has never been more obvious than at this moment. Having begun to "build stately" the desire to "garden finely," which means the desire for something more than trees and shrubs spotted about on a lawn, is already becoming apparent. If this desire, then, is to be satisfied, if our gardens are to prove worthy of our architecture, designers of ability must no longer be satisfied to lay down their pencil upon completion of the four walls of their house. Instead of leaving the surroundings of their buildings to the mercies of the amateur and the jobbing gardener, they must realize that garden design demands creative power of a high order, and retain control of the immediate surroundings of the building.

GARDEN AT WARREN ROAD, TORONTO.

The charm of the garden is of a different order from the charm of wild nature. The art of garden design is not the art of copying nature, but of subduing her vagaries to the requirements of man. The lotus capital in the Egyptian Temple is not a copy of the lotus, but its adaptation to man's needs. The very freedom of design as applied to gardens, the lack of restraining barriers, the absence of formulae, give scope for the expression of personality and provide those subtleties of the art which constitute so much of its charm and its difficulty.

A prominent Toronto artist said to me the other day: "Given an open field, how do you go to work to design a garden?" He might well ask. "After the war," says the client, "I intend to build a house. Please design me a garden." While the client comes forward in full confidence the artist asks for explanations, seeing at once the necessity for co-operation between garden designer and architect. If that unity between house and garden, upon which depends the success of both, is to be achieved, both must be designed together. But which is to do the wagging—the dog or the tail? Are the necessities of the garden, the views, and approach to decide the disposition of the rooms of the house, or is the house to be built and the garden thought out later?

Now, my friend the artist being a designer of ability, knew that all design, if successful, must be controlled by certain guiding principles. He asked for enlightenment as to the motifs controlling the layout of gardens. The fact that these principles vary widely with each different problem, the difficulties surrounding their discovery, and their application, constitutes the greatest fascination of the practise of garden design, and entitles it to high rank among the fine arts. It has been said that gardening is the one art in which it is impossible to copy other people's work. Which means that the garden plan must be a natural development built up on certain specific human needs. Only in this way can the charm of the Old World garden, full of individuality, yet free from self-conscious effort, be attained, as is very desirable.

Regarding house and garden as one, what are the principles which will govern its design? First, the location of the house. Second, the disposition of the various rooms. Third, the location of the offices, outbuildings, garage, etc. Fourth, the location of entrance and approach. Fifth, the location of the various necessities of the grounds, such as kitchen garden, tennis court, bowling green, conservatories, greenhouses, etc. Sixth, the natural or artificial boundaries of the property. Seventh, the natural and topographical features of the property, such as trees, levels, drainage, soil, etc.

Regarding the location of the house everything will depend on the size and nature of the property, but the following principles will often apply: The house should be set, if practicable, at a higher level than the entrance, so that the approach will rise to it. It should be backed

GARDEN AT DUNVEGAN ROAD, TORONTO.

up if possible by trees or hillside. Full advantage should be taken of the best views. The location should be such as to economize the property.

It is desirable to have the entrance on the north, the kitchen and offices on the northeast, the living rooms on the west, south and east.

The drying yard, service court, garage, etc., should be located on the east of kitchen side, entirely shut off from the living rooms and pleasure grounds.

The entrance should be placed in the direction of greatest traffic on public road. The entrance drive should follow the natural contours, though avoiding the top of a ridge.

A fairly level site with good soil should be chosen for the kitchen garden, near the service area, but convenient to the pleasure grounds. Tennis courts, though part of the pleasure grounds, should be more or less screened, as they are usually unsightly.

Conservatories and greenhouses should be placed in direct communication with the house, but not in a prominent position, as they are usually unsightly when seen from outside.

GARDEN AT HIGHLAND AVENUE, TORONTO.

The natural and artificial boundaries of the property will often provide reasons for the shape and size of gardens. They will often have to be screened out so as to make the property look as large as possible.

As I said above, it is the very freedom of art which constitutes its greatest danger. The amateur experiences difficulty in knowing where to start, and having started, in finding out when to stop. It may safely be said that such efforts always result in affectation and self-consciousness. "When in doubt do nothing," applies as much to gardens as to any other form of design. No civilization can ever be complete without gardens. Let those who are equipped by academic study and natural ability for design see to it that the Canadian garden of the future proves worthy of the civilization which we are building.

OLD FARM HOME BEFORE RE-MODELLING.

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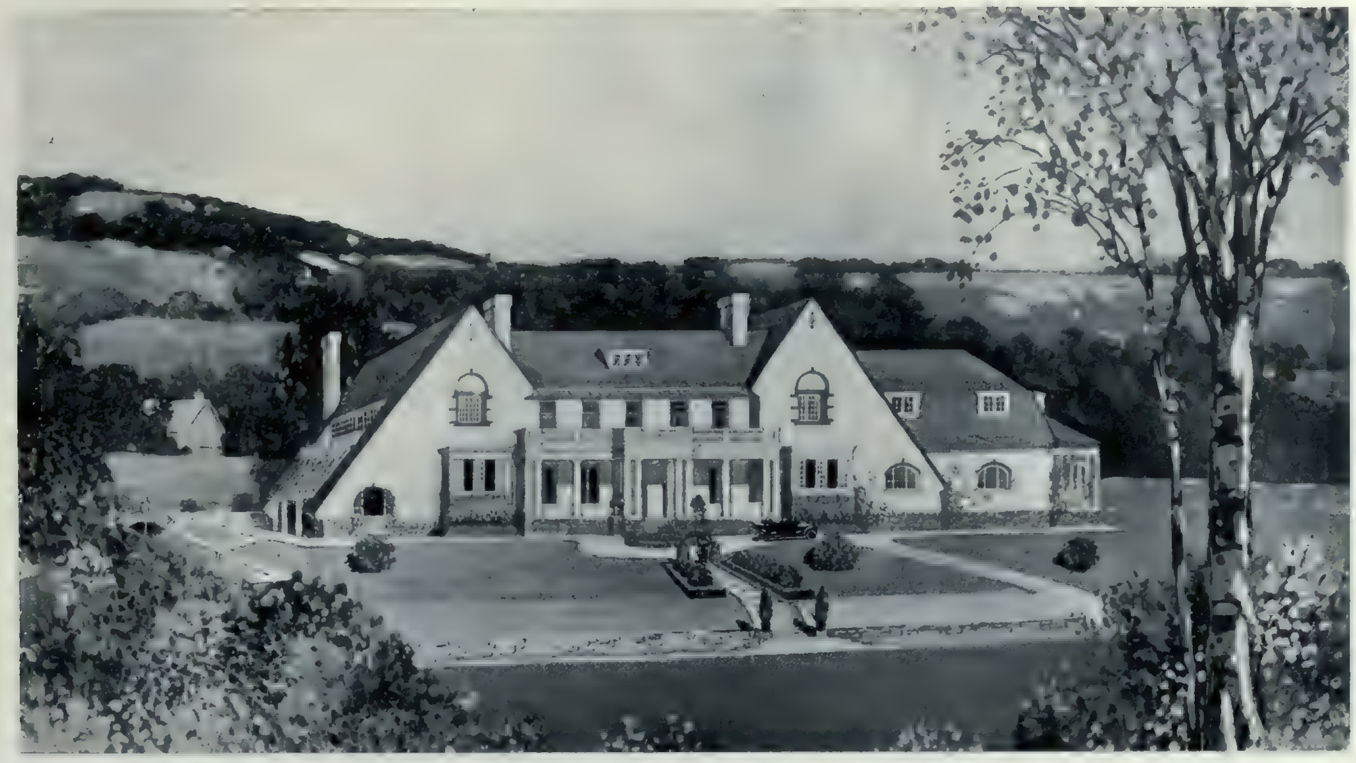
Among the suggestions for heating symbols and abbreviations, made at the recent meeting of the British heating engineers, is that in place of the British thermal unit, or B.T.U., it is proposed to use the word "Therms" and to indicate it by the Greek letter, theta, with this difference, that the letter would have a bar extended beyond the vertical lines.



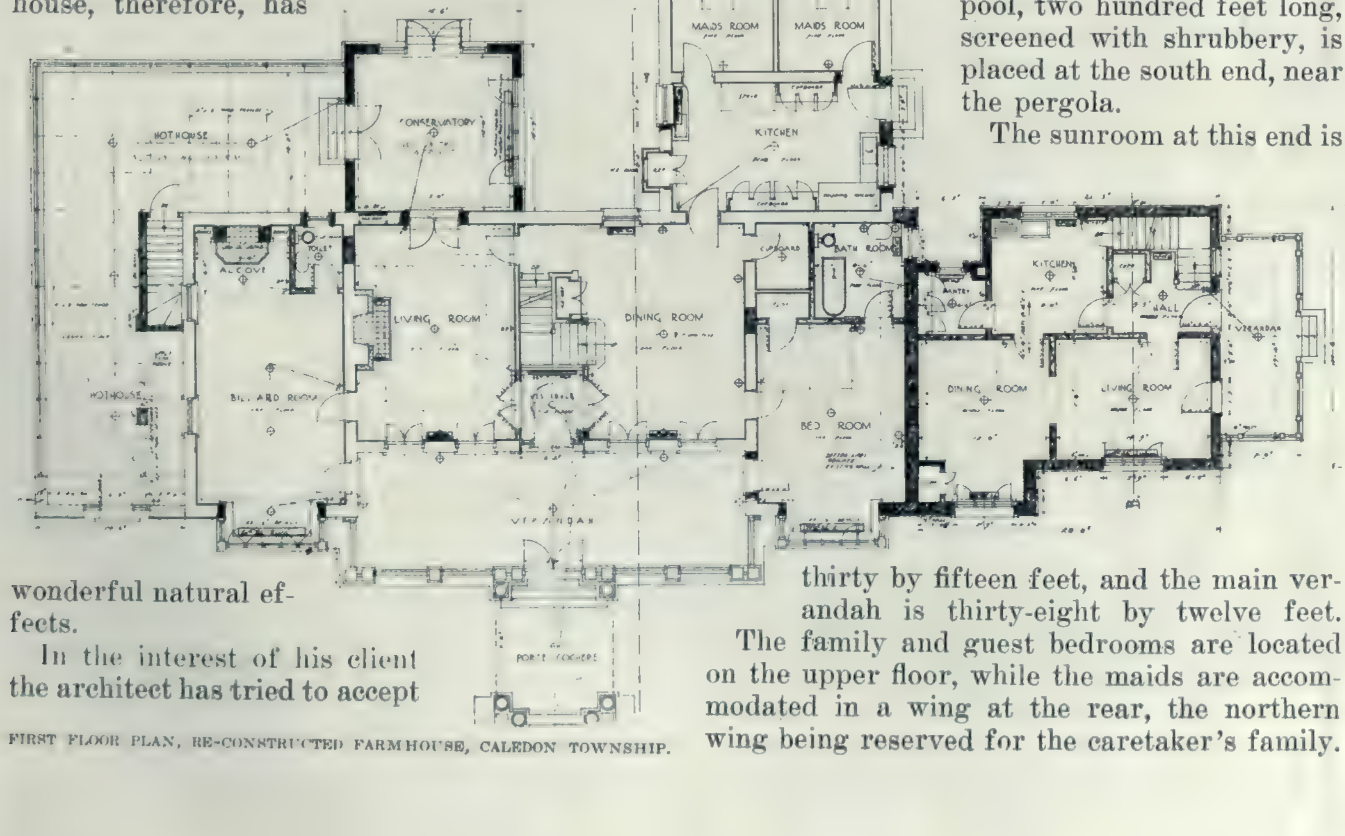
RE-CONSTRUCTED FARMHOUSE, DODSWOOD FARM, CALEDON TOWNSHIP. J. M. JEFFERY, ARCHITECT.

A COUNTRY HOME AT ALTON

The architect's problem here was to transform the old farm homestead into a modern country home, incorporating the existing house as far as possible.

Sentiment entered largely into this scheme, as this old homestead was the birthplace of the owner, Mr. Andrew Dods, Toronto.

This estate is naturally adapted for the enjoyment of nature, being situated at the summit of the Caledon Mountain, near Orangeville, Ontario, only a short distance from the Caledon Trout Club grounds, and the setting of the house, therefore, has wonderful natural effects.



FIRST FLOOR PLAN, RE-CONSTRUCTED FARMHOUSE, CALEDON TOWNSHIP.

In the interest of his client the architect has tried to accept loyally all practical conditions and needs of real importance, and has worked them out to suit modern conditions while preserving the idea of an inviting and restful country home without display.

With a few small changes the existing plan has been opened up, and the main stairway broadened out and leading from the dining room, which is panelled and trimmed in oak, the living room in mahogany, and the billiard room in mission oak, with beamed ceiling.

A system of rain and spring water is established throughout the house, and an inviting swimming pool, two hundred feet long, screened with shrubbery, is placed at the south end, near the pergola.

The sunroom at this end is thirty by fifteen feet, and the main verandah is thirty-eight by twelve feet.

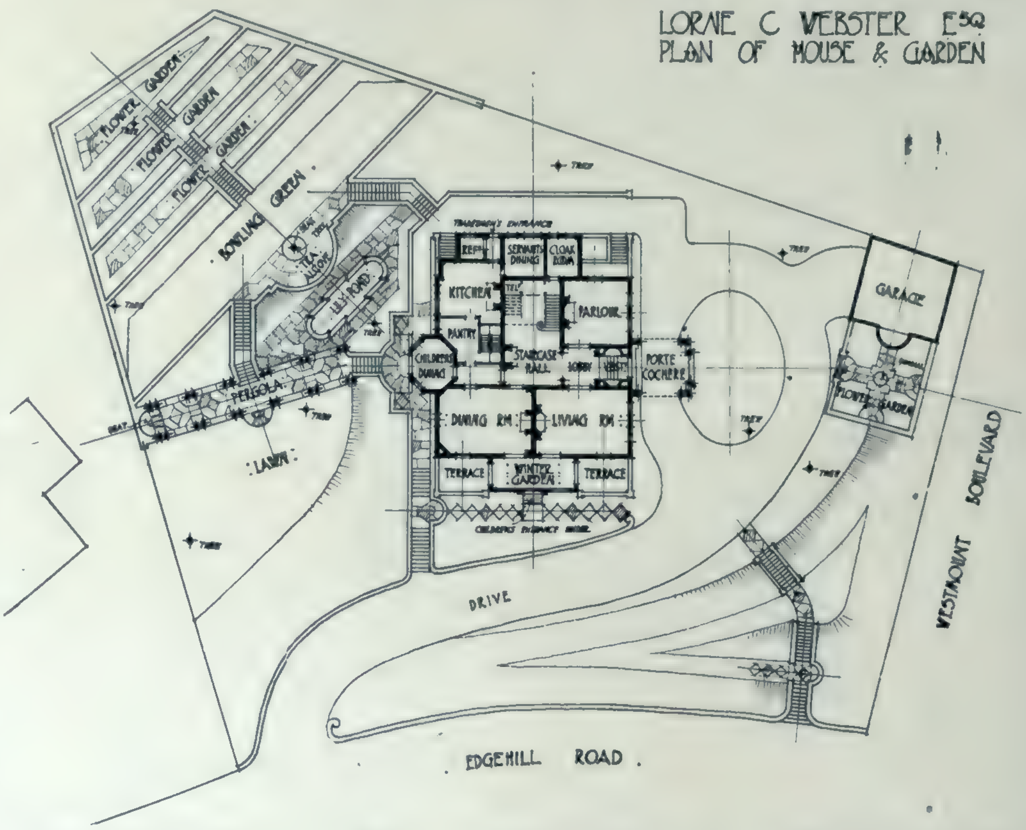
The family and guest bedrooms are located on the upper floor, while the maids are accommodated in a wing at the rear, the northern wing being reserved for the caretaker's family.

Mountain Side House at Westmount, Montreal

Attractive Home and Grounds Planned for Mr. L. C. Webster, of Montreal.

THIS house is built on a very interesting site at the juncture of Westmount Boulevard and Edgehill Road. It commands magnificent views over the River St. Lawrence, the house being set out to obtain the greatest advantage from the location; all the principal rooms getting the benefit of the outlook to the river.

Owing to the varying levels the site was rather a difficult one to treat, and it was complicated by the position of some very fine trees which it was desired to retain—an existing stable was already on the site, one-quarter of which was retained as a garage with new windows and red brick facings on the old walls, the remainder being pulled down and a formal garden planned on same.



The house faces due north and south, the main entrance with a porte-cochere entered on the east front—a pergola is being erected on the west front, and will balance the porte-cochere and the garage in the general composition, as will be seen in the plan illustration.

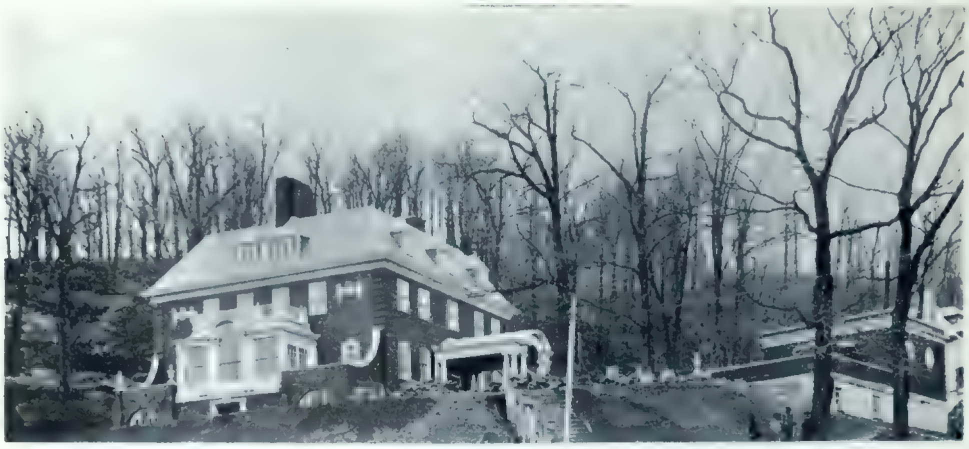
The gardens have been designed to harmonize with and form part of the architectural scheme of the house. The stone staircase to the pergola is placed on the central axis of the house, and is approached from the children's dining room. At the head of the stairs the pergola itself is swung outwards from this axis in relative position to the axis formed by the garage.

Stone steps lead from the centre of the pergola to the tea alcove on the higher terrace, this alcove is placed around an existing tree, and the intervening space between the alcove and the pergola on the lower level will be utilized for a lily pond and rock garden.

A second staircase is planned leading from the tea alcove to the back entrance, and will form convenient access for service from the kitchen.

A bowling green is to be provided level with the alcove, and the remaining portion of the ground will be utilized for three ascending terraces of flower gardens, with stone walks and stone retaining walls continued to the boundaries of the site.

The ground floor of the house contains a large staircase hall which could be used as an extra reception room, two vestibules between it and the entrance door. There is a parlor entered to the right



RESIDENCE OF LORNE C. WEBSTER, MONTREAL. SEPTIMUS WARWICK, ARCHITECT.

DINING ROOM AND SUN PARLOR, WEBSTER RESIDENCE.

of the vestibule, with the living room on the opposite side. This latter room is connected to the main dining room by a winter garden, which forms the principal architectural feature of the south front with two terraces leading from same.

There are three dining rooms provided—the one just referred to—and two others for the children and servants—all three are grouped conveniently near the kitchen.

The principal bedroom floor has four bedrooms, each with a separate bathroom and fixed wardrobe accommodation, an upstairs sitting room leading to the front balcony, and a large linen store well lighted, which will act as a sewing room, and is fitted with an ironing board and electric iron. Balconies are provided to all the rooms, three of them being so arranged that they can be used as sleeping porches; a housemaid's sink is placed on this floor near the service stairs.

The top floor contains day and night nurseries and three bedrooms, with a children's bathroom, large cupboard accommodation, and a cedar closet for furs about ten feet square. The servants' quarters, with bathroom and linen store, are provided in the northwest corner of the house.

In the basement separate entrances are planned both for the furnace room and the laundry, and a linen chute from each floor discharging into the latter room; vegetable stores, potting shed, and a boys' workshop are provided, with a billiard room and a large "ingle nook" designed around a tapestry brick fireplace. A children's entrance is provided on this floor with three stores near the entrance for sleighs, snowshoes, etc. The cloak room is placed upstairs so that it serves this entrance as well as the main entrance on the floor over.

RECEPTION ROOM, WEBSTER RESIDENCE.

BILLIARD ROOM, WEBSTER RESIDENCE.

In order to overcome the discomforts of a winter sash, extra radiation is being provided and weather stripping installed on all the windows which are single throughout, and so that the exterior shall present the same appearance all the year round, internal Venetian blinds are being fixed to the windows to obviate the necessity of fixing and unfixing the summer shutters each spring and fall.

Externally the walls are faced with specially made dark red Roman bricks twelve inches by one and a half inches, with one-half inch white mortar joints raked out three-eighths inch, a line of headers is introduced every sixth course, carrying the line of the rustication of the angle quoins round the building; the stone dressings are of grey canyon stone, the roofs are covered with rough green slates laid in graduating courses.

The two bays on the north front are formed by the projecting bathrooms, and the bay window on the west front by the sleeping porch entered from the side bedroom.

The pergola is to be carried out with wood columns painted white, with a stone slab pavement; the garden walls will be built in rough limestone, mostly from material quarried on the site, the treads of the steps and the coping being

MAIN HALL, WEBSTER RESIDENCE.

of Rochester stone slabs, which will also be used for the stone paths of the formal garden next the garage.

The garage will accommodate two cars, and the old basement of the stables is being transferred into sleeping quarters for the chauffeur, with a circular stair from the garage.

In order to adapt the architectural features of the house to the site and to spread the apparent weight of the building on the ground, four wing circular ramped walls are introduced at the corners, these forming flanking walls to the two terraces on the south front and retaining walls for the laundry and furnace room staircases on the north, the spaces between the walls making larger accommodation in the basement, enabling the potting shed and the coal stores to be placed in this position, giving also extra space to the billiard room, which is twenty-seven feet by twenty-five feet extreme dimensions.

The principal rooms internally are panelled in Keene's cement and painted, instead of wood. The appearance as finished is practically the same, and there is no risk of the joints cracking, as is invariably the case after a few years when a room is finished in a painted wood. The fireplace surroundings are also in Keene's cement, and the interiors of openings are faced with buff and orange colored briquettes and hearths, with a lining to the dining room and parlor of Pavonazzo marble. The hall fireplace and columns and the entrance lobby are carried out in Caen stone. This work and the panelling before referred to, were executed by the general contractor, and form a good example of superior workmanship in plaster. The lobby steps and dado are in Botticini marble, and the main rooms are covered with oak flooring in narrow widths laid herring-bone fashion.

The winter garden is paved with red quarry tiles and Missisquoi marble, and the walls and ceiling cove are covered with a trelliage pattern painted green; a wall fountain is provided on the back wall, and the radiators are to be covered with a cast iron grill painted green with flower boxes designed to match the trellis work of the walls.

The kitchen is tiled up to the height of seven feet with white tiling, and all the cupboards are painted and enamelled in the same color. The stove is placed on a platform of red quarry tiling, with an ash dump to the basement. The doors and the cupboards to the service pantry are finished in chestnut.

The other doors throughout are in birch, and will be finished to match the prevailing treatment of the rooms.

The design of the house externally and internally follows the traditions of the Early Georgian Period, with some slight alterations to adapt the styles to the Canadian climate.

The whole contract for the house and garden has been carried out by Anglins, Limited, the architect being Septimus Warwick, Montreal.

RESIDENCE OF MAJOR E. G. M. CAPE, MONTREAL. CHARLES J. SAXE, ARCHITECT.

A HANDSOME LIMESTONE HOME

The residence of Major E. G. M. Cape, of Montreal, situated on Pine avenue, and commanding an excellent view of the entire city, was not intended to portray any decided style of architecture, but rather an attempt was made by the architects to design a residence which would be in keeping with its surroundings. The large amount of limestone terrace work, walls and fences of the latter material which are found in this locality suggested that the same material should be adopted for the walls of house.

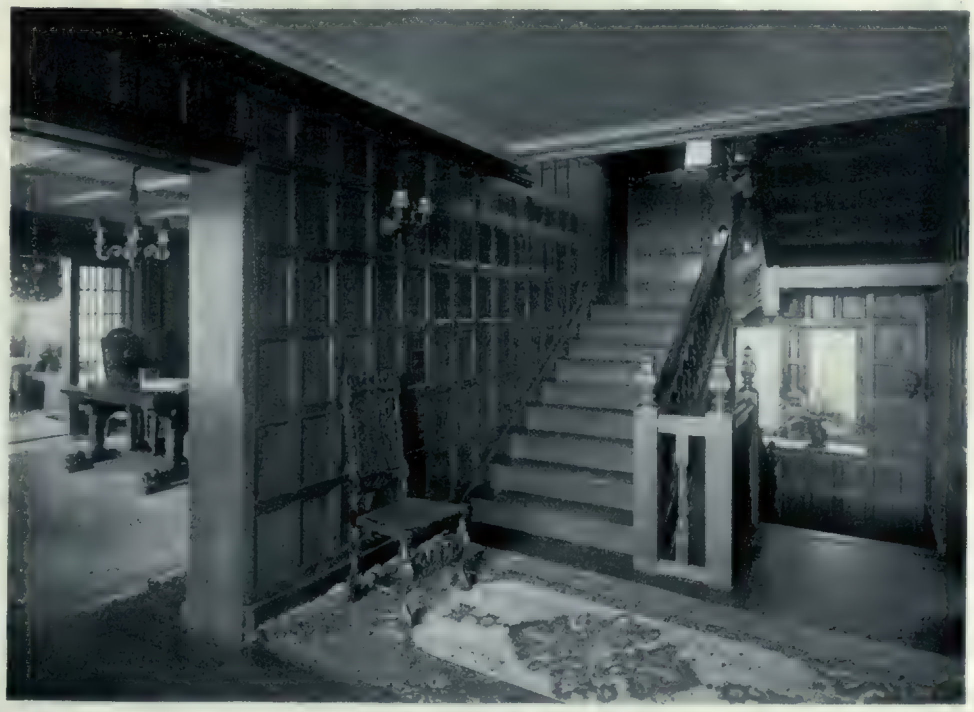
Great care was exhibited in selecting the facing stones, to use only the stones which have been mellowed by iron rust or exposed to the weather, eliminating as much as possible the cold gray-blue of the limestone.

The house stands upon solid rock of the mountain. the space occupied by the garage being blasted out of the solid material, and all stone secured in this way was used to erect the walls of the house, which greatly reduced the cost of the latter. Since this house was erected three or four others have been added to this locality, and all look much better than the imported brick or sandstone.

The house is roofed in Spanish tile, which runs in color all the way from a deep purply-blue to reddish brown. The woodwork on exterior, which has been eliminated as much as possible, is colored in white.

The basement, which is the first floor above garage, is occupied by a stone lined entrance hall, with marble floor, together with billiard room, coal room, laundry stoves, etc.

The principal floor, which is practically three floors above the street, commands a delightful view of the city, and has a southern exposure which means plenty of sunlight.

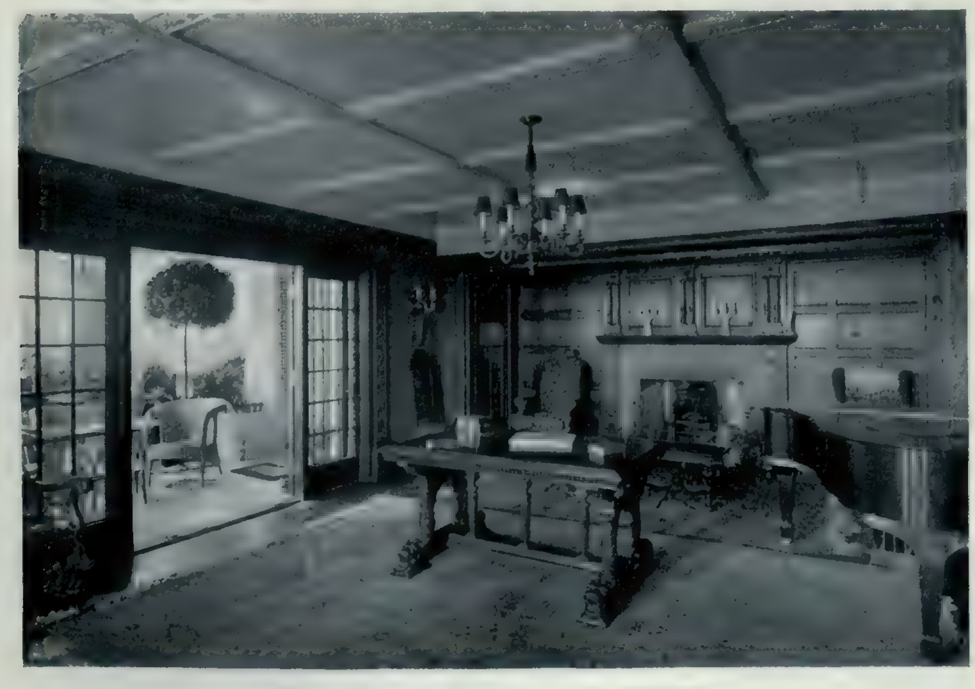

HALLWAY, CAPE RESIDENCE.

Two views of interior stair hall and living room are shown. The stair has been faithfully carried out in the Elizabethan period. The newel posts are beautifully carved, while the hall is finished entirely of fumed oak.

The living room, from which a sunroom opens off, is of very satisfactory dimensions, and is carried out in oak and brown tapestry.

The furniture of all the important rooms was designed and purchased in London, England, and, unlike most of the English furniture, has not shown any defects owing to our rigorous climate.

The architect was Charles J. Saxe, Montreal.


LIVING ROOM AND SUN ROOM, CAPE RESIDENCE.

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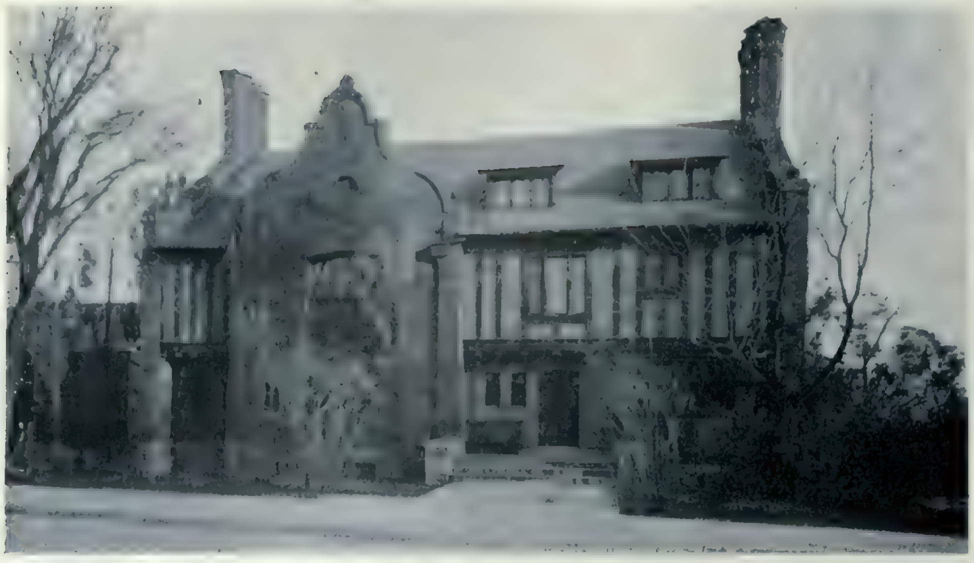
If you make no profit on jobs you do, you are not making money, no matter how much business you are doing.



RESIDENCE OF F. H. ANSON, MONTREAL. SAXE & ARCHIBALD, ARCHITECTS.

UNUSUAL HOUSE AT MONTREAL

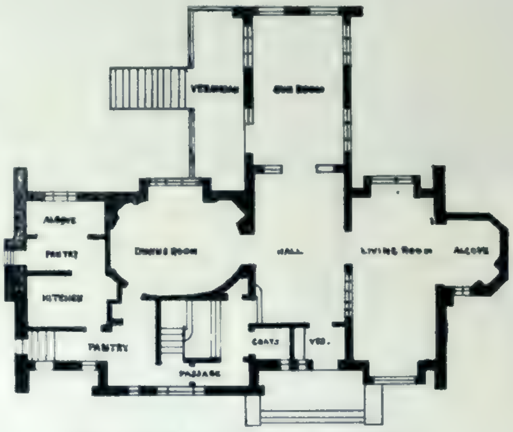
The residence of F. H. Anson, Montreal, is of unusual design, the exterior being of "run of kiln" common brick, varying in color from light red to very dark red, almost black, laid in yellow mortar. The walls of the first floor are of wood construction, finished on the exterior with plaster and half timber.

All the exterior woodwork is of British Columbia cedar, and simply given a coat of oil.

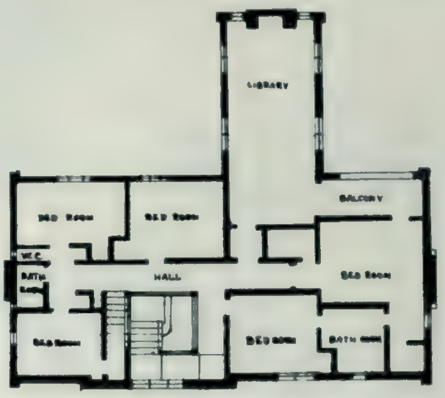
The dining room, living room and hall are finished in oak, the remainder of the house being in white enamel, the view of the sun parlor showing a most comfortable and delightful addition to the home. The library on the second floor is located above the sunroom and is very large and well lighted.

The dining room is centrally located, and, with its rounded corners, has a very attractive appearance.

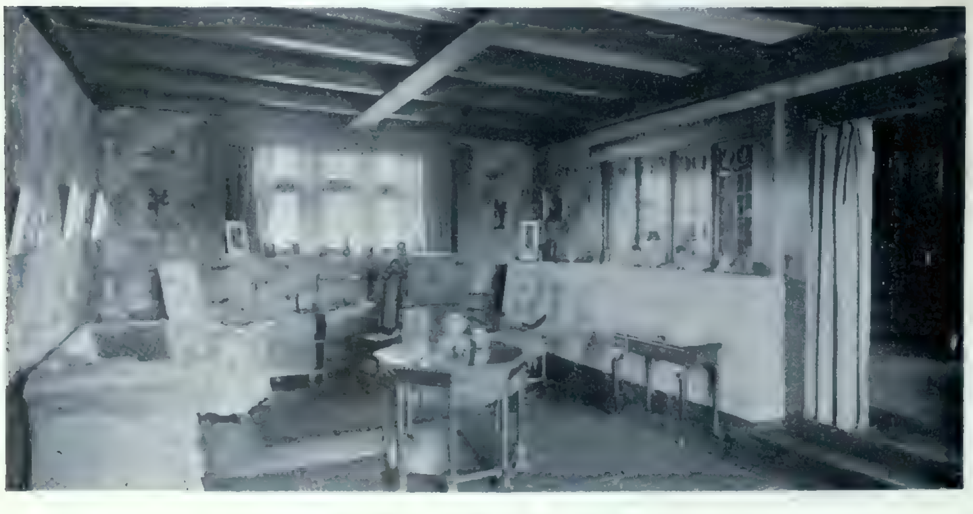
Saxe & Archibald, Montreal, were the architects.



FIRST FLOOR PLAN, ANSON RESIDENCE.



SECOND FLOOR PLAN, ANSON RESIDENCE.



LIVING ROOM IN ANSON RESIDENCE.

AN ENGLISH TYPE COTTAGE

The residence of Wm. B. Preston, Esq., Dufferin avenue, Brantford, shows some careful detail designing on the part of the architect. With enough English cottage "feeling" in character for the site, it is one of Brantford's most successfully designed homes.

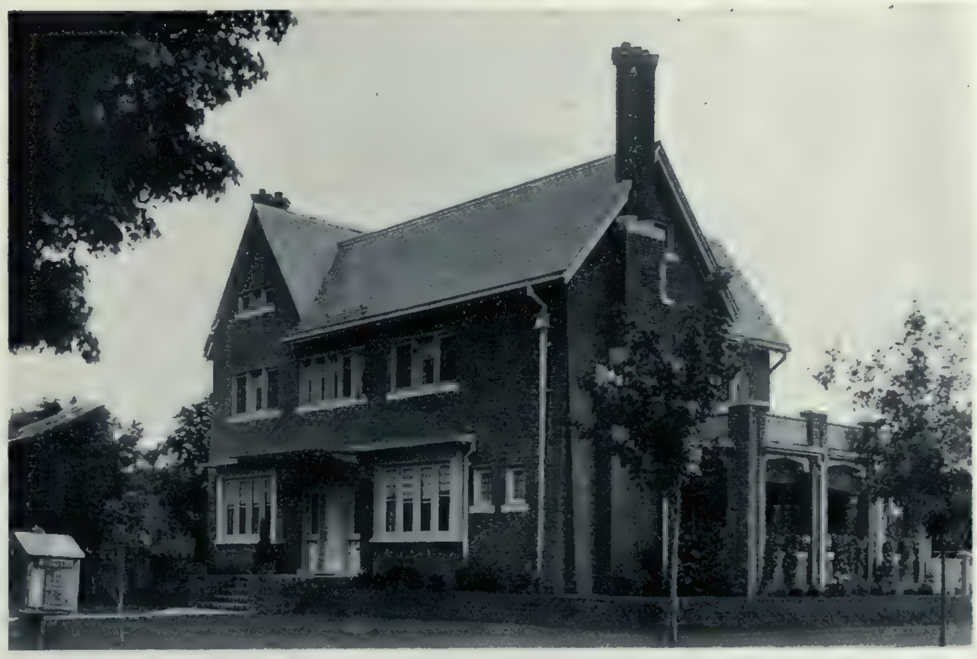
The absence of front verandahs is characteristic of the designer's work, and in this case the light was especially required as the house faces almost north. The site is one of the choice lots of the city and the enclosed side verandah looks out over St. Paul's avenue on the west. The brick used is dark brick, laid in English bond, with dark headers and lighter stretchers, black mortar joint racked out, giving a very pleasing color effect.

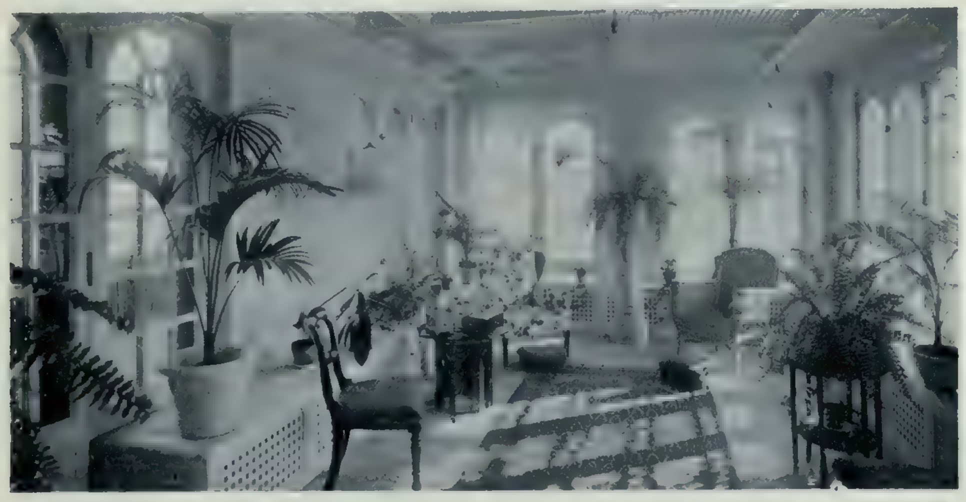
The plan shown herewith includes a central stair hall running through to the rear, and lighted from over the landing at the rear with art glass, the detail of the stair being rather on the delicate with curtain newel ending. The large living room on the right is very inviting and "cosy," with an ingle across the end with a large open mantel, and French doors leading to the sunroom. The dining room is connected to the living room with French doors, and is also approached from the hall. On the left of the hall is a den which may be used as a reception room (if such a room is ever used again in modern homes).

The trim on the ground floor is mahogany for dining room and hall, and plain cut oak for the living room and den.

The servery and kitchen are fitted with every convenience possible.

The second floor bedrooms are large and airy, with large casement windows. The trim is in white wood with mahogany doors. The enamel finish is a pure white.


RESIDENCE OF W. B. PRESTON, BRANTFORD. LLOYD D. BARBER, ARCHITECT.


SUN PARLOR IN ANSON RESIDENCE.

The third floor is finished for maids' rooms, and has separate bathrooms, the same trim as on the second floor.

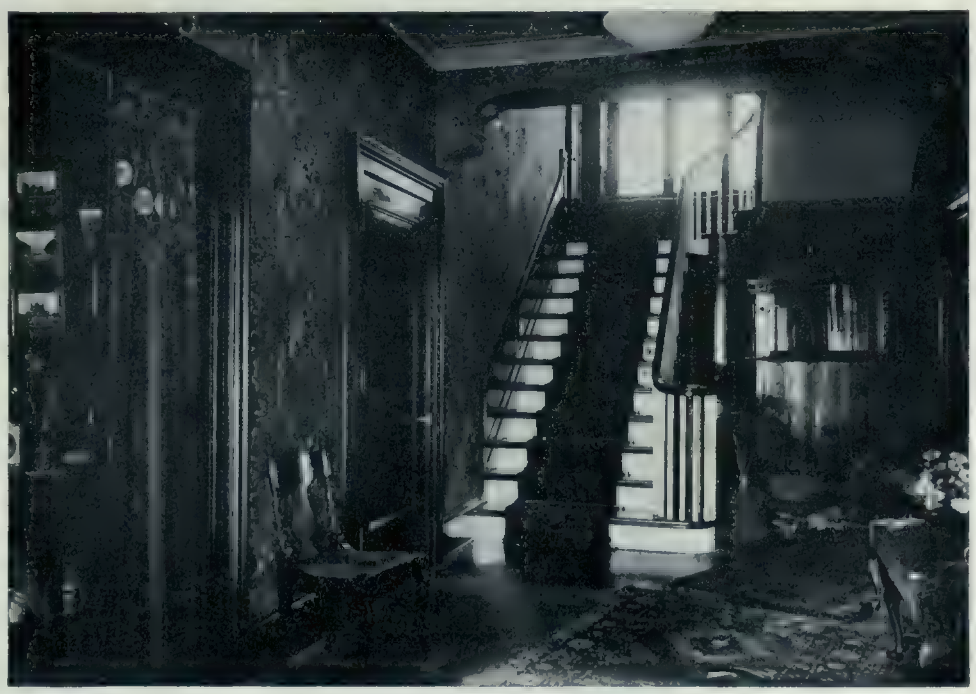
The work was designed by Lloyd D. Barber, architect, Brantford.

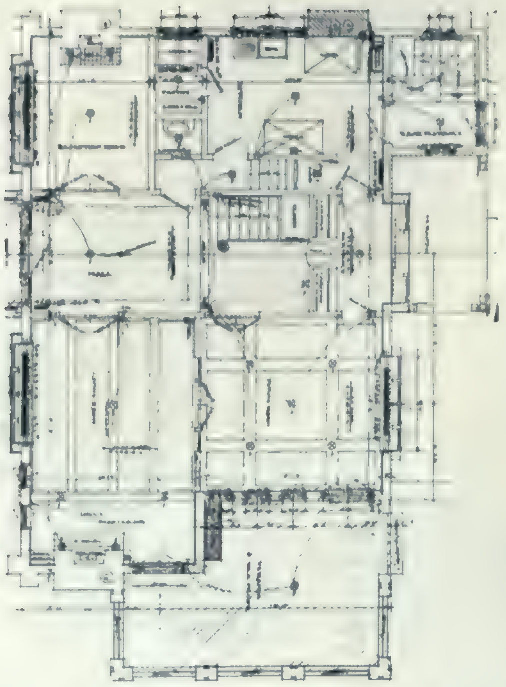
◆

A WINDSOR HOME OF MERIT

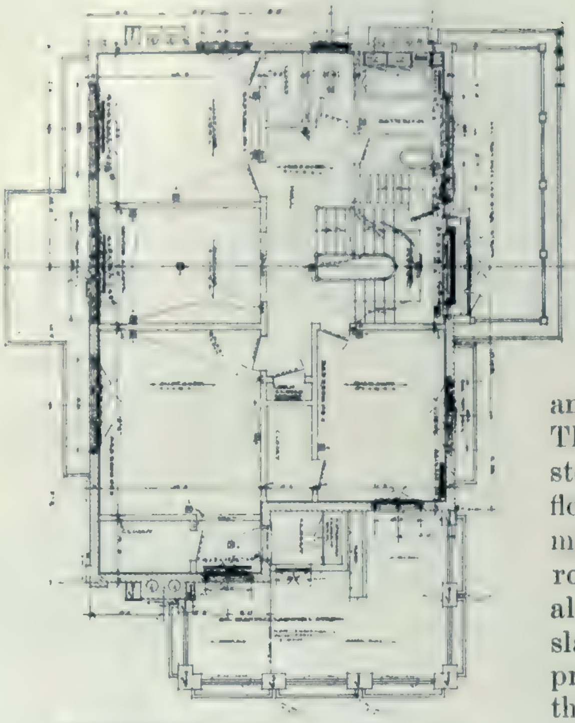
The home of C. W. Cadwell, Windsor, is built of dark grey brick, laid in Flemish bond with special pattern work, as shown in the illustrations. The base course is built up of split field stone, bevelled out four inches. The second storey is stucco roughcast. The roof is slate. The cost of this house was twenty-three thousand dollars.

The rooms downstairs are all finished in oak. Second floor rooms are finished in white enamel —doors, stained mahogany. In the basement a vacuum cleaner machine has been installed with outlets to different parts of the house, for attaching cleaner hose. A low pressure steam boiler furnishes the heat. On the third floor is a billiard hall.


HALLWAY IN PRESTON RESIDENCE.



FIRST FLOOR PLAN, PRESTON RESIDENCE.



SECOND FLOOR PLAN, PRESTON RESIDENCE.

Leybourne & Whitney were the architects. The firm has since dissolved, and Malcolm Leybourne has taken over the practice.

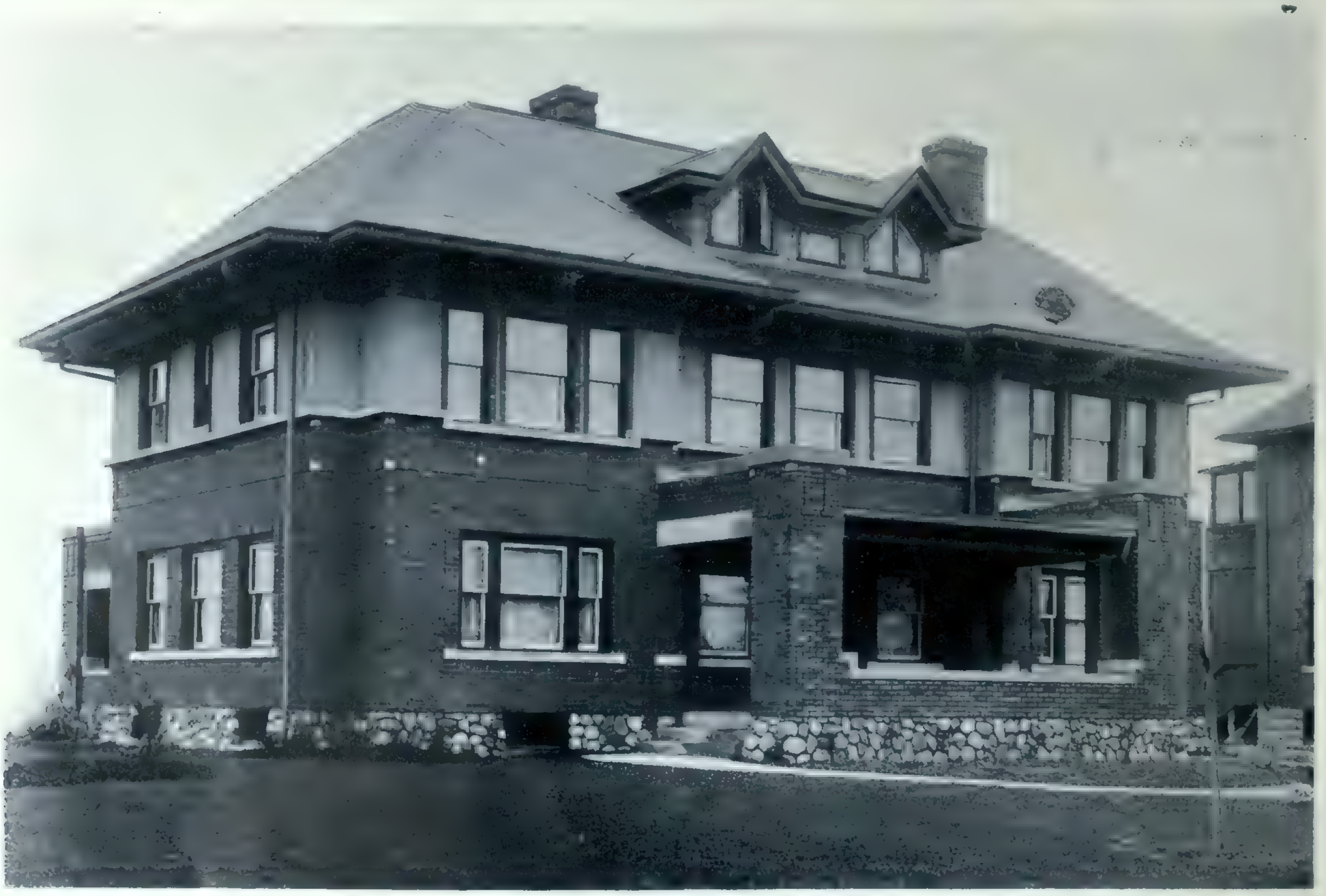
A DUTCH COLONIAL CITY HOME

This house is in the style of the Dutch Colonial, erected by the early Dutch settlers in the New England States, designed by F. W. Warren, architect. The bricks, of a pleasant red, are impervious wire-cut laid up in beach sand mortar.

Interesting designs of brick and white stucco form attractive panels around the front windows and in the chimneys. The foundation is stone plastered and floated with cement mortar, while the roof is laid diagonally of grey asbestos slate, from which protrude in front three unique dormer windows.

The interior, also Colonial, presents a very cheerful appearance. The hall is finished in white enamel with mahogany doors, and an artistic touch is added by the stained glass window on the stair landing.

The living room and dining room are finished in stained red oak. The living room, which extends across one side of the house, is made exceedingly cheerful by its open tile fireplace. The door of this room opens on a large brick floored



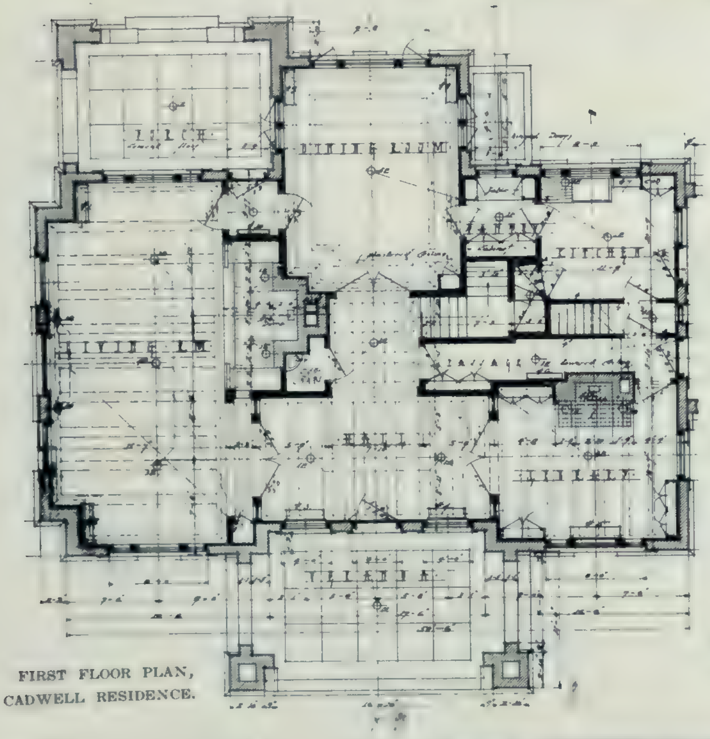
RESIDENCE OF C. W. CADWELL, WINDSOR. LEYBOURNE & WHITNEY, ARCHITECTS.

verandah, which is also repeated on the second storey.

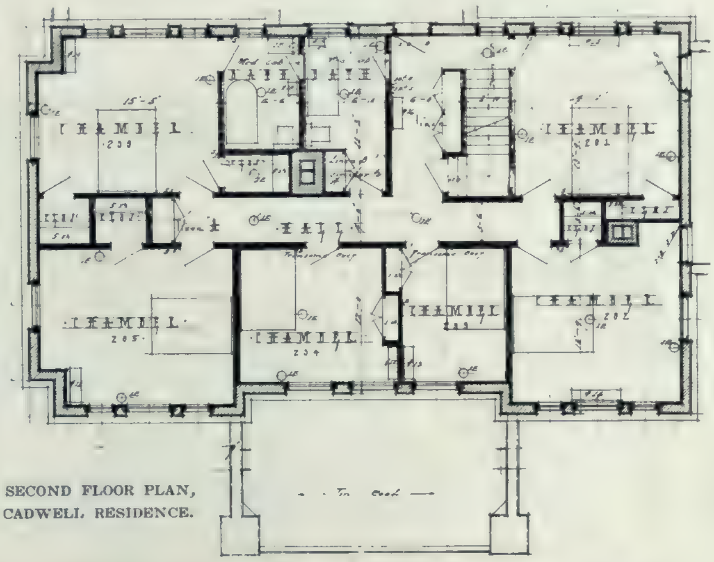
The dining room also adds an interesting note with its panelled walls and beamed ceiling, and also has a fireplace.

The porch in front is entirely in keeping with its two white seats, while the quaint brass knocker and side lights, in which are inserted in leaded glass the owner's coat-of-arms and motto, add the completing touch to the harmonious ensemble.

LIVING ROOM IN CADWELL RESIDENCE.



FIRST FLOOR PLAN, CADWELL RESIDENCE.



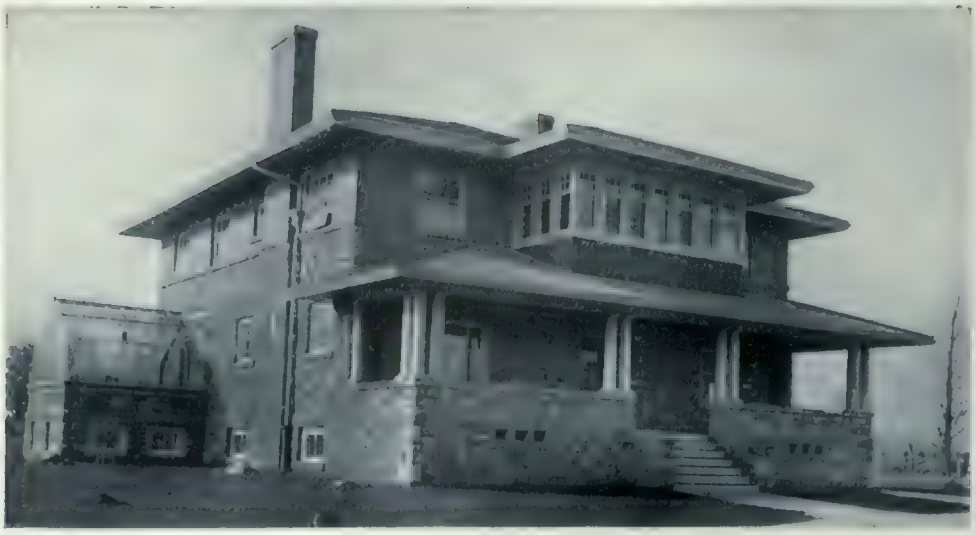
SECOND FLOOR PLAN, CADWELL RESIDENCE.

WOULD DEMOLISH 3,000 HOUSES

In reporting upon housing conditions to the Toronto Board of Health recently, Dr. Hastings, Medical Officer of Health, recommended that something be done to replace three thousand houses in the city.

Dr. Hastings pointed out that there never was a time when there was so much per capita wealth in Canada as there is at present. From figures quoted it was shown that the wealth of Canada, represented by bank deposits, was $92.50 for each unit of population. This amount is above the per capita wealth of any other nation in the world.

DEN IN CADWELL RESIDENCE.



RESIDENCE OF M. G. HENNIGER, CONTRACTOR, SMITH'S FALLS.

A TOWN HOUSE AT SMITH'S FALLS

THIS home was designed by the owner, M. G. Henninger, contractor, Smith's Falls, Ont., and built by him by day labor.

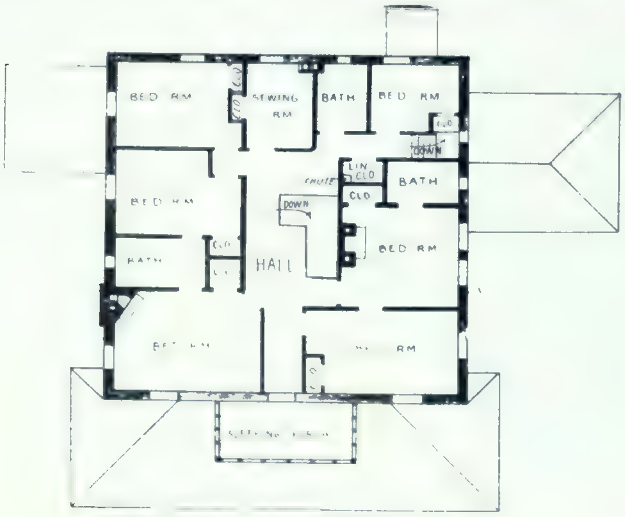
The first, or ground floor plan, was first laid out to suit the requirements, and then the basement, with some minor details, on exactly the same plan, so that when construction was started in October, 1915, the concrete basement floor was laid first, extending out about six to ten inches under the outside walls. On this floor all the basement partitions were built fair under the first floor partitions of four-inch brick work, and carried up and bonded in with the concrete outside walls, which are fourteen inches thick.

The brick walls were carried up around the first floor joist to the underneath side of the rough or first flooring directly, on which was placed the studding for the first floor partitions, thus eliminating any possibility of settlement. The four-inch walls were laid in a lime and cement mortar, and although the basement is eight feet in the clear, the walls seem to be amply ridged. The bricks are well laid, and make an excellent wall finish for basement rooms.

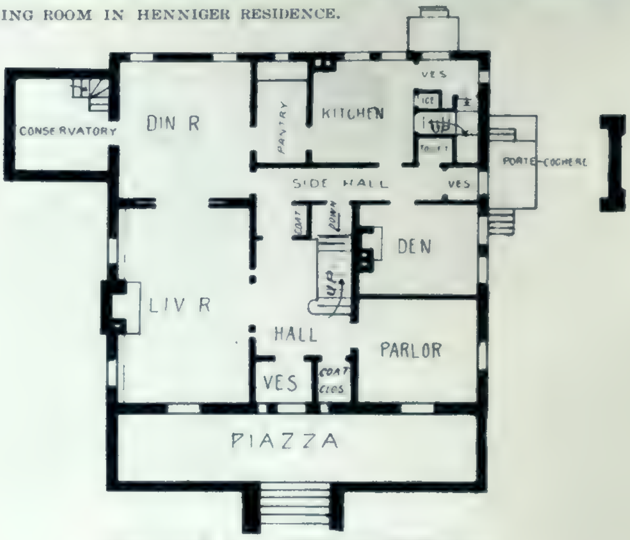
LIVING ROOM IN HENNIGER RESIDENCE.

The one large room under the living room is finished with lath and plaster, making a desirable play room. The laundry is located in the basement, supplied with porcelain tubs and a "jacket-heater" laundry stove.

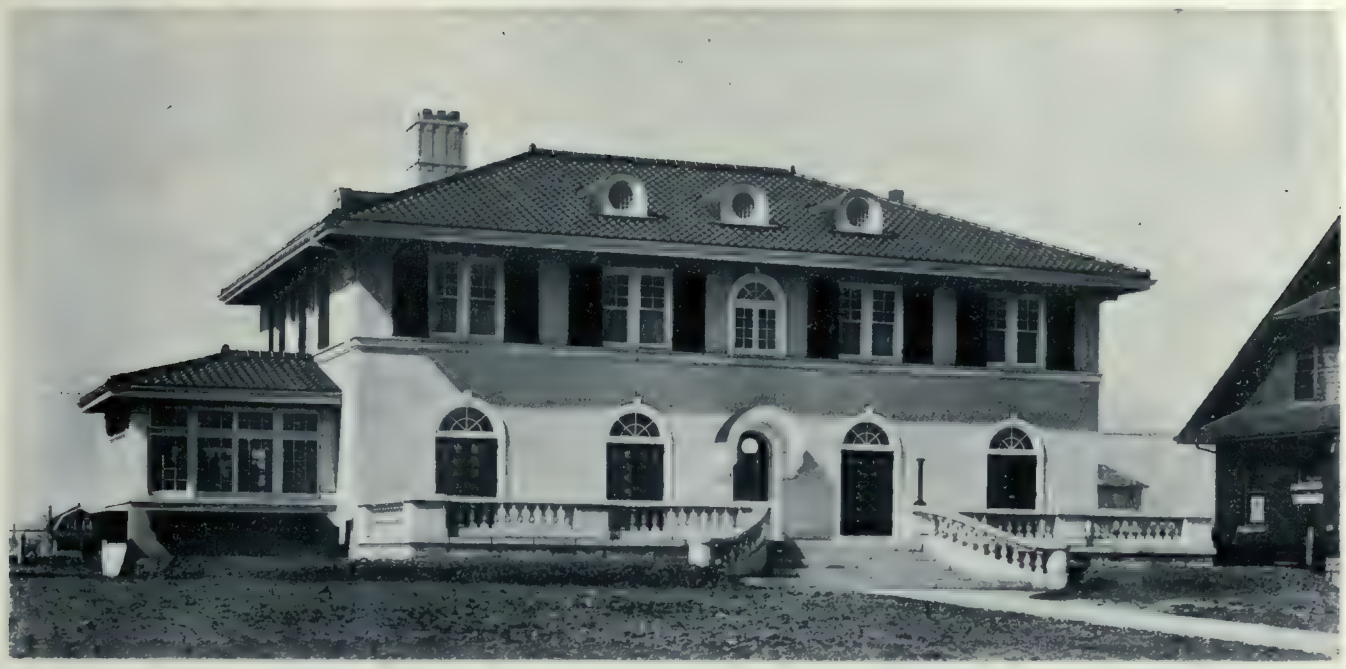
A hot water boiler, fed with buckwheat grade of coal, supplies ample heat. The conservatory basement makes a convenient place for the potting of plants, etc. A stairway leads direct to the conservatory above. The stationary



SECOND FLOOR PLAN, HENNIGER RESIDENCE.



FIRST FLOOR PLAN, HENNIGER RESIDENCE.



RESIDENCE OF LEO PAGE, WINDSOR. G. JACQUES & CO., ARCHITECTS.

vacuum cleaner is installed in the basement, with suction or air pipes leading to the floors above.

A large stone fireplace is situated in the living room, built of the same kind of stone as the outside walls of the house, the balance of the space between the fireplace and the ends of the room being filled in with bookcases, making an attractive living room. The conservatory opens off the dining room.

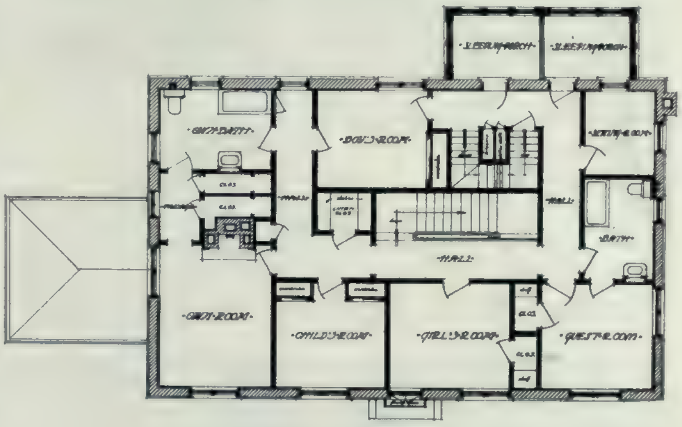
The front stairway, halls, living room, dining room and den are finished in quarter-cut oak, the halls and living room wainscoted four and one-half feet high.

The house being almost square, the upstairs lays out very conveniently. On this floor there are five bedrooms, as well as maids' room and serving room, three bathrooms, closets off all rooms, linen closet and clothes chute to laundry. Also sleeping porch over front piazza. This floor is finished in yellow pine, the halls and north rooms being tinted a very light cherry, and the balance finished natural wood.

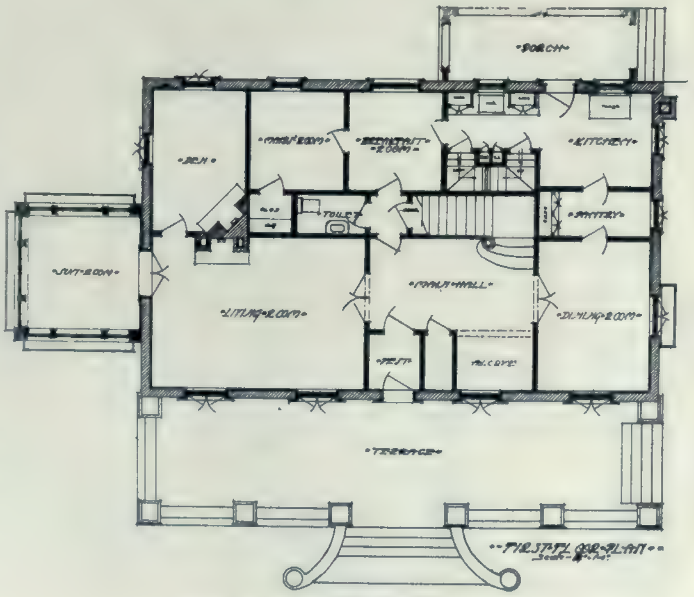
Two of the upstairs rooms have fireplaces; also den and living room downstairs. The floors are all hardwood—oak downstairs and red birch upstairs.

The outside walls are solid concrete up to the grade line. From the ground line up to the second storey windows the walls are what might be termed "stone veneer" with concrete backing. Up to the top of the base, on which a two-inch wash is cut, the walls are fourteen inches thick, and from there up are twelve inches thick. Concrete forms were built for the inside of the walls, and before the concrete was placed tarred felt was placed on the forms to serve as a protection against dampness, and when the forms were removed this felt adhered to the concrete, forming a tarred felt covering over all the concrete outside walls.

After the forms were built and the tarred felt adjusted the masons would build up the stone-



SECOND FLOOR PLAN, PAGE RESIDENCE.



FIRST FLOOR PLAN, PAGE RESIDENCE.

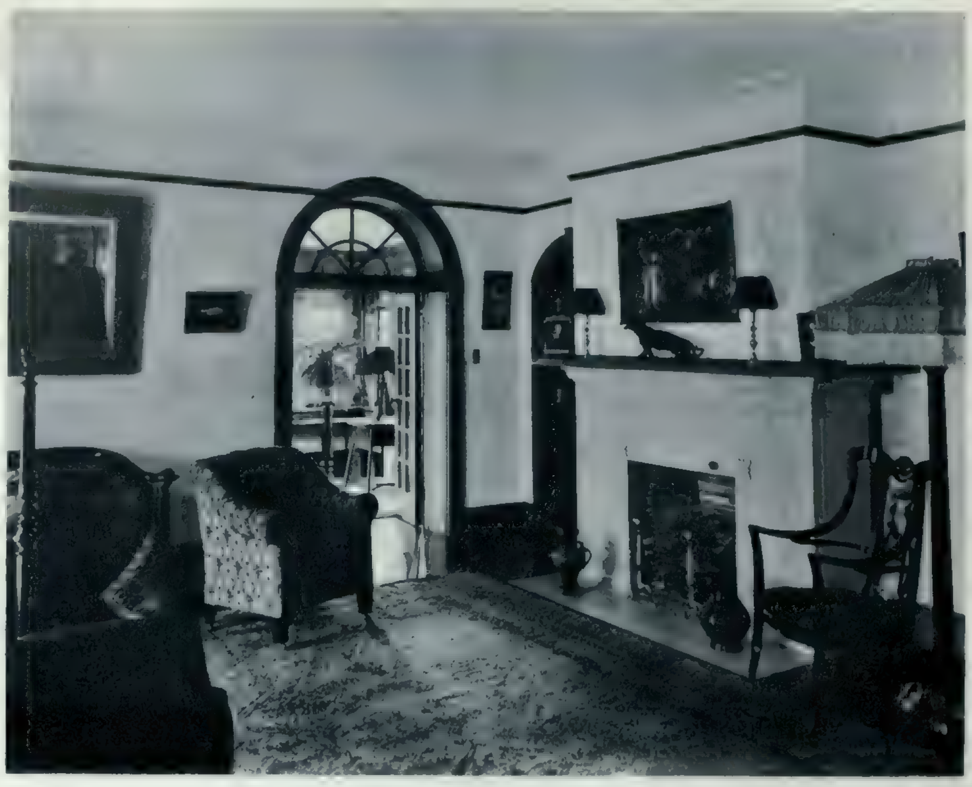
work about two feet high along one of the walls, using cement and lime mortar, which in a few hours was ready for the concrete backing. The concrete gang would then pour the concrete, which would run into all the vacancies, back of and between the stones, forming the whole into one monolithic mass. The window and door frames were set and fastened to the forms, the concrete was run under and around them, filling up the grooves ploughed in them to receive the concrete, making an airtight joint around all doors and windows.

The stone veneer varies in thickness, some of which is not more than two inches, and some runs nearly through the wall. The soft color of the stone blends nicely with the buff brick of the upper storey, and with the red "asbestoslate" roof, laid nine inches to the weather, the effect is pleasing. A stone house effect is obtained by this form of construction, without the heavy, bulky walls usual in stone houses.

A STUCCO AND TILE RESIDENCE

The Leo Page residence, at Windsor, Ont., with its spacious terrace, arched and shuttered windows and dormer windows in tile roof, presents a very attractive appearance. Exclusive of terraces, sunroom and porches this residence is thirty-five by fifty-six feet.

The foundation is of solid concrete. Interior walls are of twelve-inch hollow tile. The roof is of Spanish tile. The exterior stucco work is applied directly to the tile and given two coats of flat, cream stucco preservative.



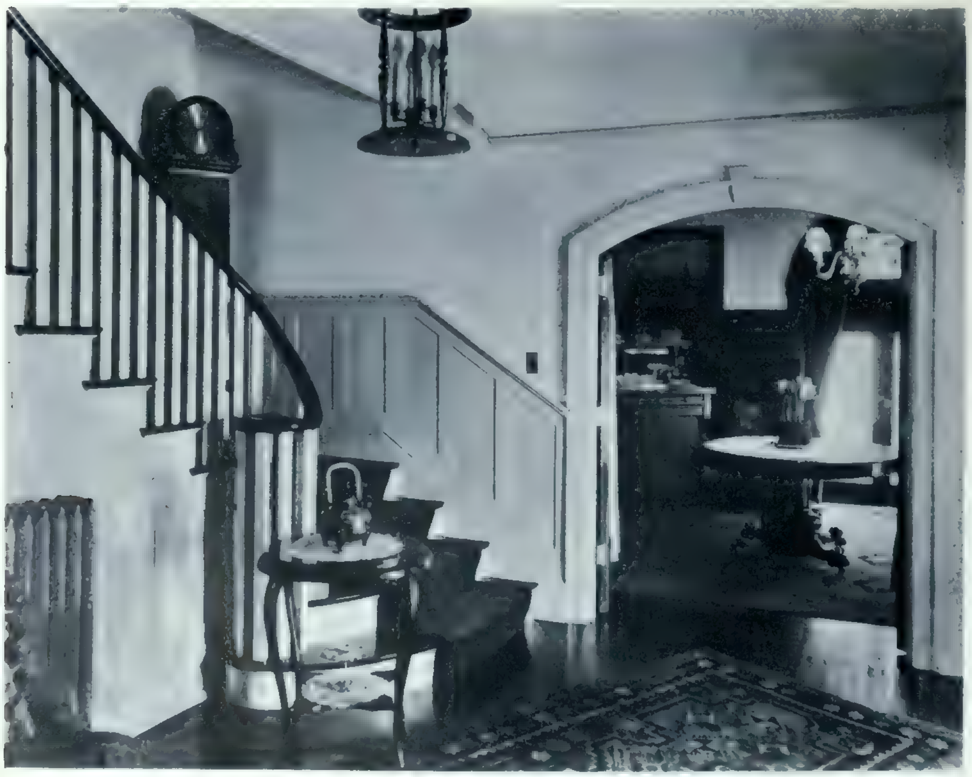
LIVING ROOM IN PAGE RESIDENCE.

The stone work in terrace and step railings is a good example of the possibilities of artificial stone for this class of work.

The interior finish of living room is silver grey, sunroom is light gold oak, den of early English, dining room dark oak.

Dining room is panelled four feet six inches high in quarter-sawed oak, with weathered finish, and has beamed ceiling. The kitchen, breakfast room, pantry and maids' room are finished in natural oak. The main hall alcove and all the second storey are finished in white enamel, with mahogany trimmings, including doors.

The fireplace in living room is of terra cotta. The fireplace in den is of rough brick, and mantel in owner's room is a light pressed brick.



HALLWAY IN PAGE RESIDENCE.

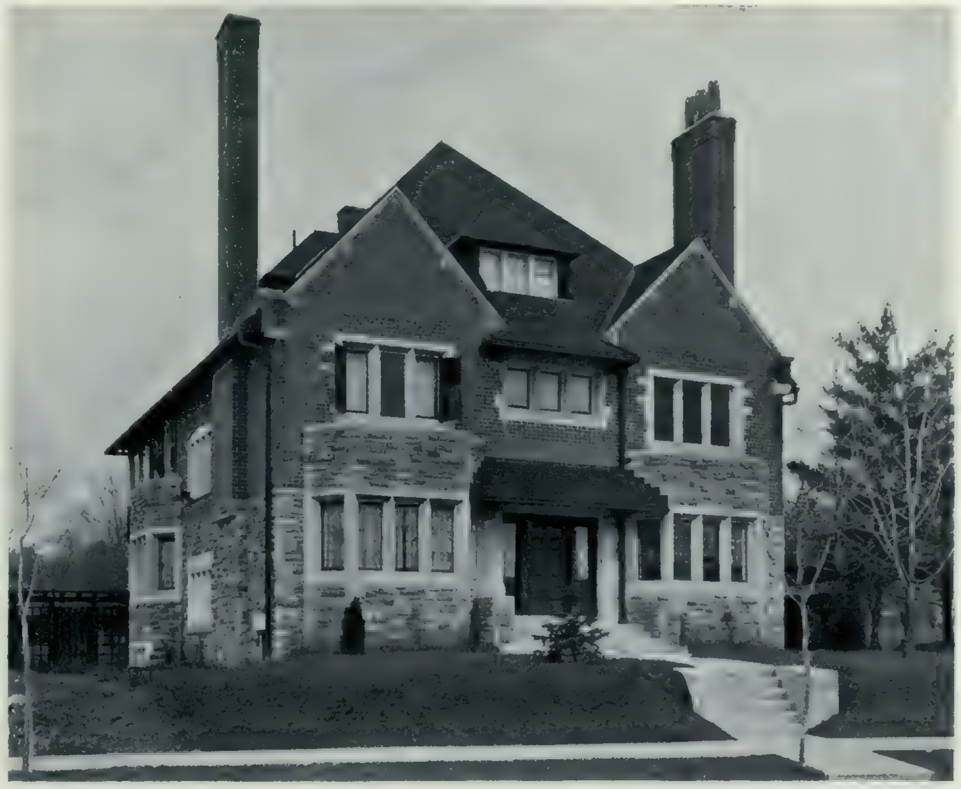
GROUP OF FOUR TORONTO HOMES

Mr. Shaw's house, on the west side of Douglas Drive, Toronto, commands an excellent view of Toronto's supreme achievement in domestic architecture — the new Government House. The house is built of red brick, with Indiana stone trim. The rubble work is mixed grey and brown Credit Valley. There is a large basement billiard room under the living room, also maids' quarters in the attic.

The ground and first floors have oak floors and trim. The bedrooms are finished in white enamel, and the reception room in grey.

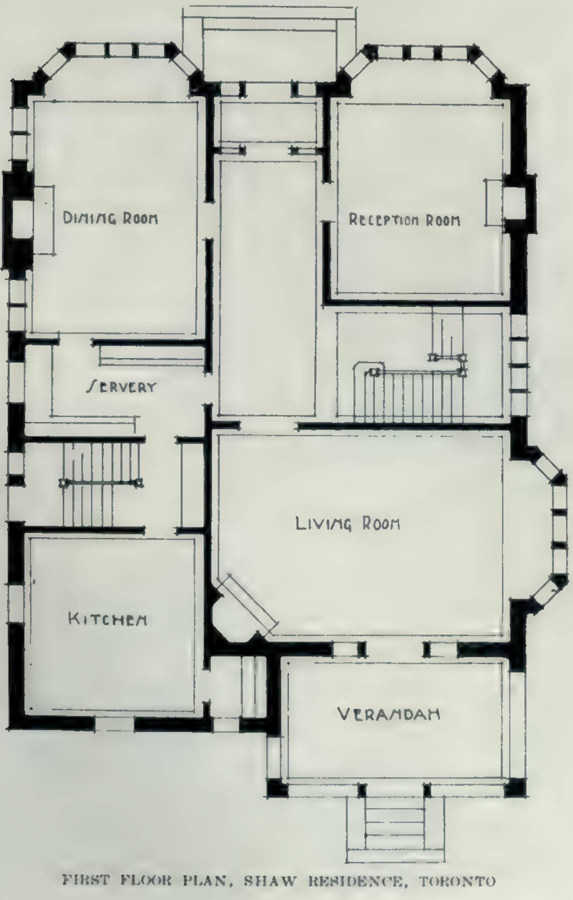
The main hall has entrances to the reception and dining rooms placed at the front, and the large living room adjoining the back verandah. The second floor contains a study, sewing room and two bathrooms, one connecting two of the bedrooms.

The home of J. Harry Fussell is situated on the east side of Oakmont road, and an endeavor was made to take advantage of the southern exposure. The dining room on the southeast corner receives the benefit of the morning sun. The interior finish of the house is simple, but the best materials obtainable were used throughout. The ground floor is stained; the first floor white enamelled throughout.

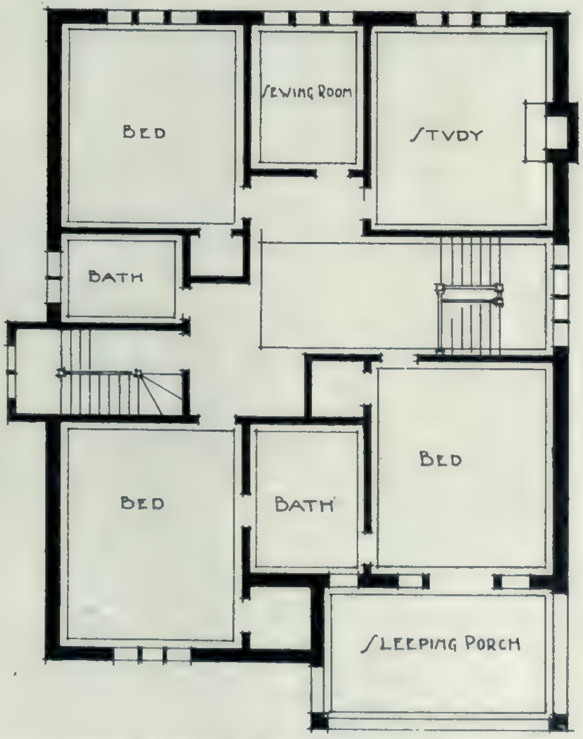


RESIDENCE OF GEORGE H. SHAW, TORONTO. EDEN SMITH & SON, ARCHITECTS.

On the east side of Oakmont road is the home of Thomas Fussell. The exterior is red brick, with brown stained shingles. The interior has oak trim and floors. The woodwork throughout is stained.



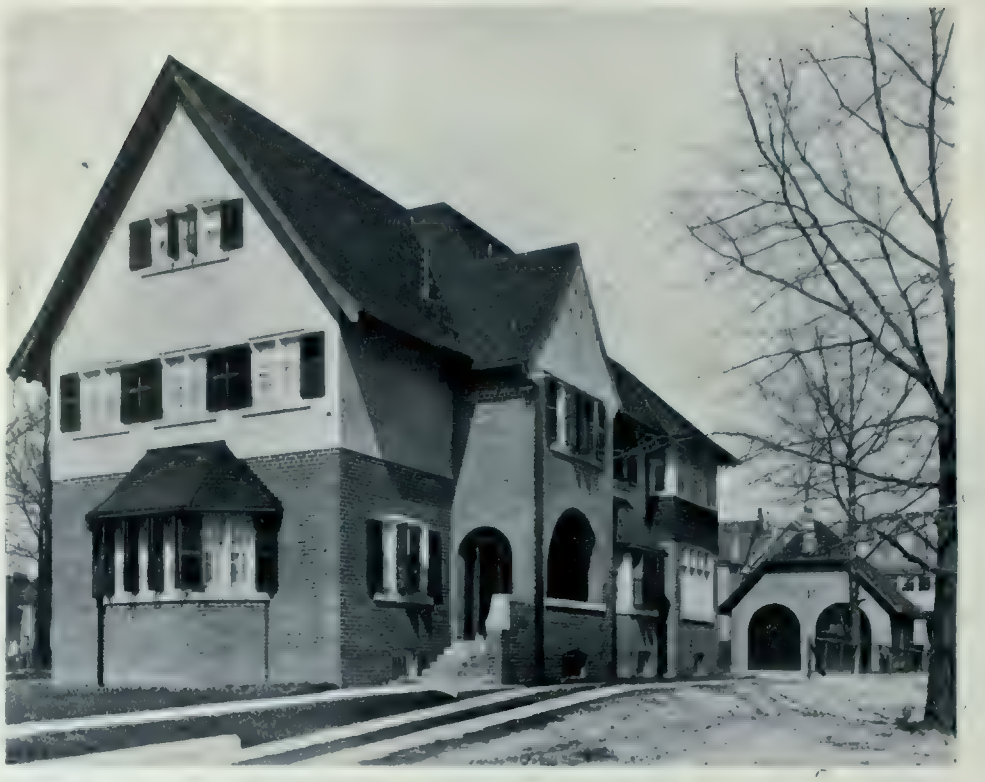
FIRST FLOOR PLAN, SHAW RESIDENCE, TORONTO



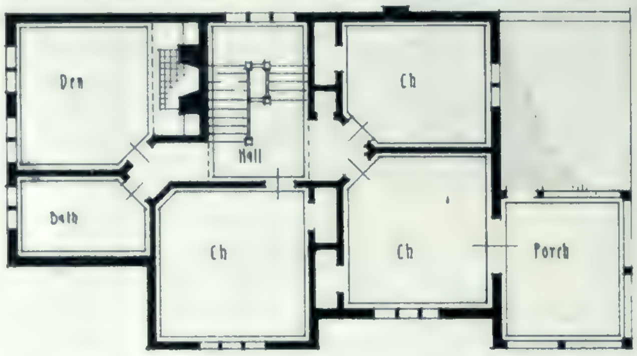
SECOND FLOOR PLAN, SHAW RESIDENCE, TORONTO

The roofed in doorway and windows, with pergola on side, gives an attractive appearance, while the large living room, ingle nook and fireplace, and connected with the sunroom, makes the leading feature of the interior of the home.

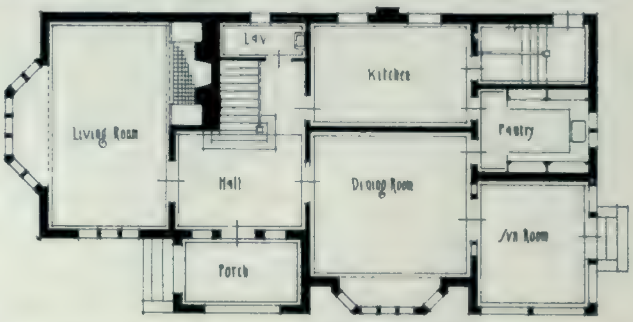
Dr. Helen MacMurchy's home is a small house, in which the desire was to obtain the maximum number of rooms in a minimum space. The requirements include an office for the doctor separated from the rest of the house, and an elevator for an invalid member of the family. The elevator gives access to all floors, also having an entrance from the garage. The inside finish of the house is principally brown-stained Georgia pine woodwork, quarter-cut oak floors and stucco walls. The first and attic storeys have brown-stained woodwork, with chintz decorations.



RESIDENCE OF J. H. FUSSELL, TORONTO. EDEN SMITH & SON, ARCHITECTS.



SECOND FLOOR PLAN, J. H. FUSSELL RESIDENCE, TORONTO.



FIRST FLOOR PLAN, J. H. FUSSELL RESIDENCE, TORONTO.

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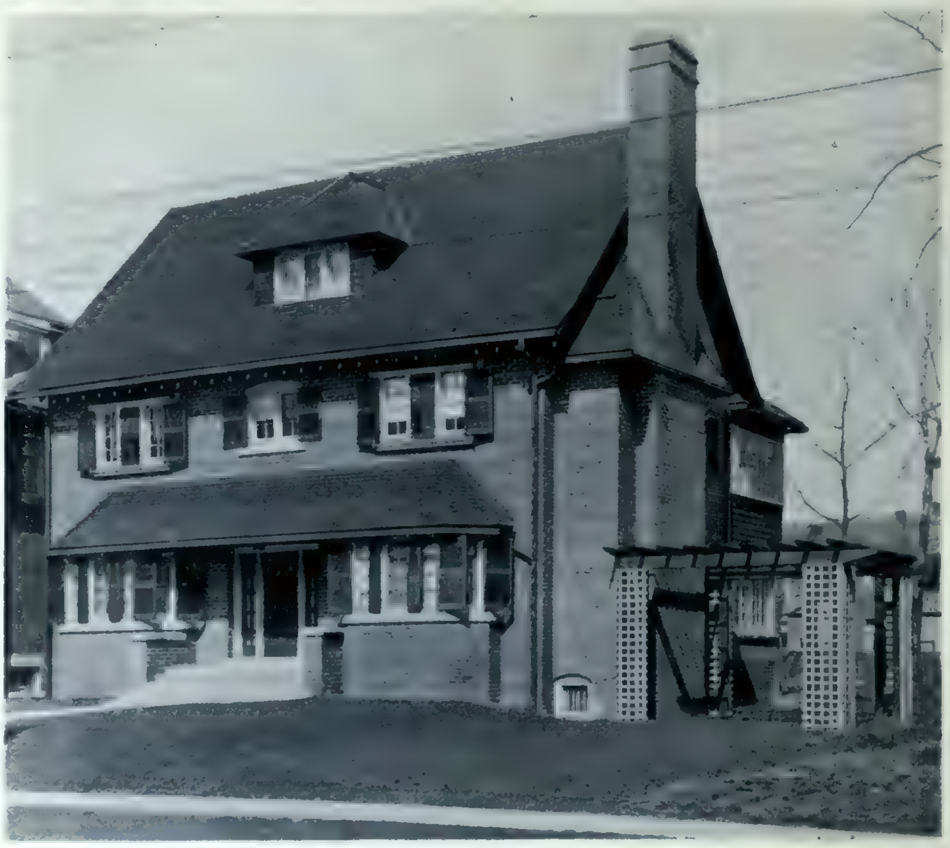
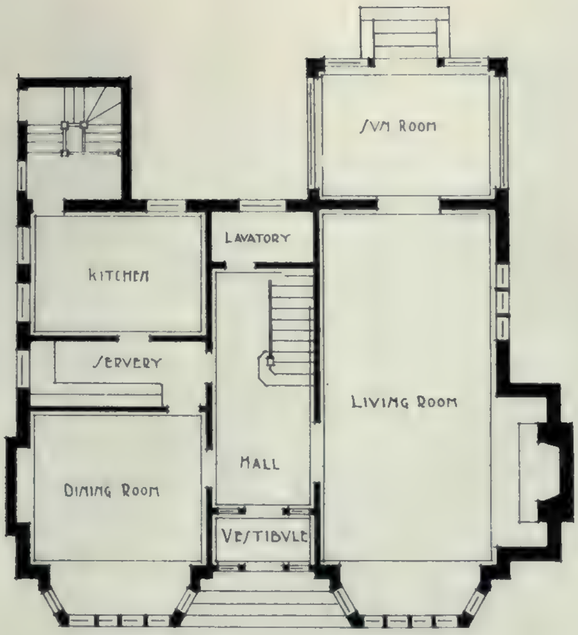
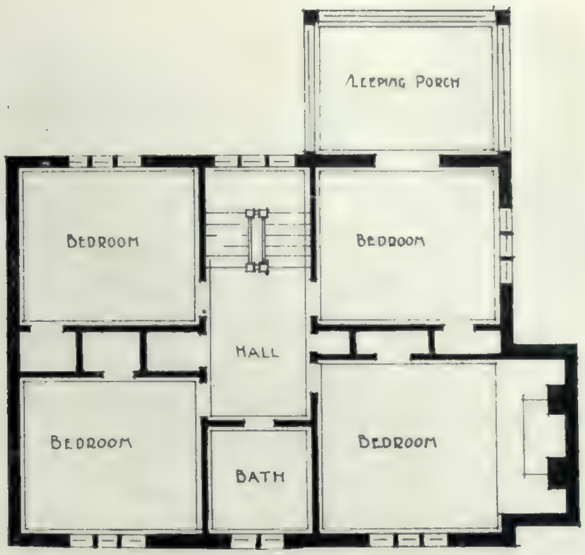
FOUR WESTMOUNT HOUSES

Anglin's, Limited, contractors of Montreal, have within the past year erected some thirty-five houses in the city of Westmount, the value being about five hundred thousand dollars. The firm are general contractors, and residence building is carried on by one department only, thus not interfering with other contract work. The accompanying photographs and plans illustrate some of the work done last year.

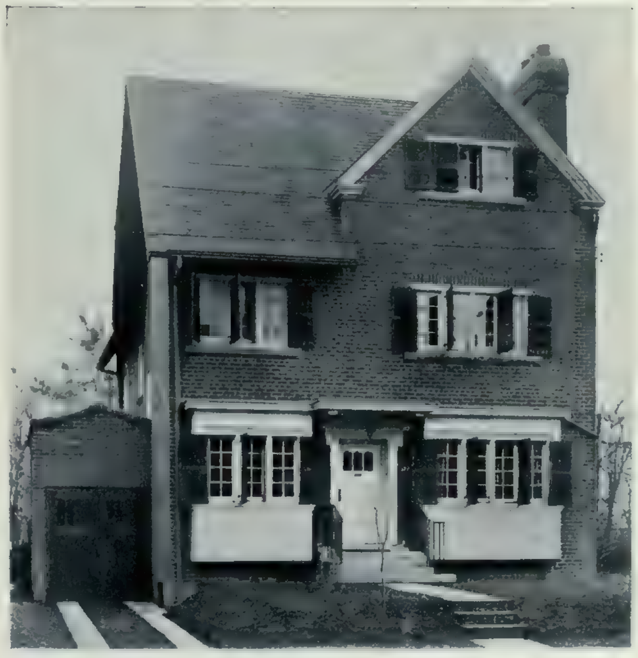


RESIDENCE OF THOMAS FUSSELL. EDEN SMITH & SON, ARCHITECTS.

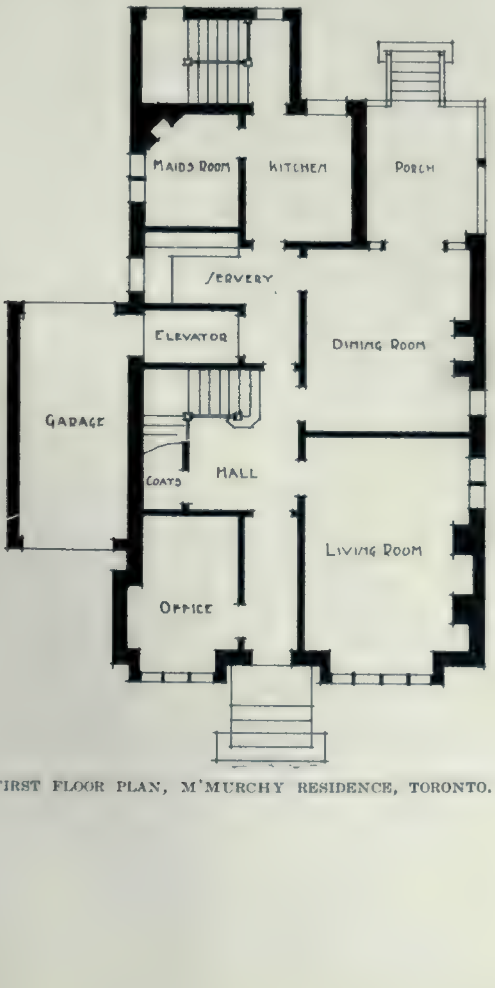




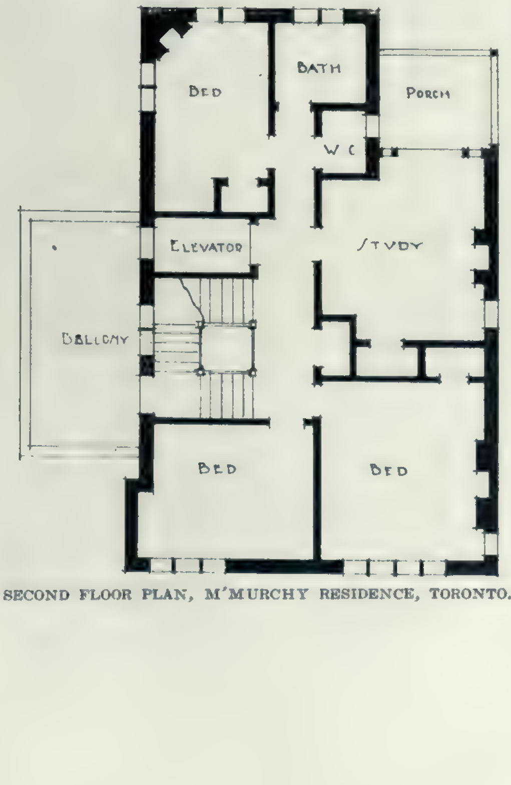
House No. 1, Westmount Boulevard, was built of buff pressed brick, with a four-inch terra cotta lining. The roof was covered with green slate. The interior was finished with birch doors, stained mahogany. Dining room was panelled in white and finished in enamel. All bedrooms and conservatory were finished in white enamel. Flooring was quartered oak, with an inlaid border in most of the rooms. The house is very compact, as shown by the plan, there being practically no waste space. The attic was left unfinished. The basement room included a billiard room, which was waterproofed and finished as a play room. A maids' room with toilet, and a conservatory are included on the first floor, the upstairs plan having an unusual bathroom and back stairs arrangement.



RESIDENCE OF DR. HELEN M'MURCHY, TORONTO.
EDEN SMITH & SON, ARCHITECTS.



FIRST FLOOR PLAN, M'MURCHY RESIDENCE, TORONTO.



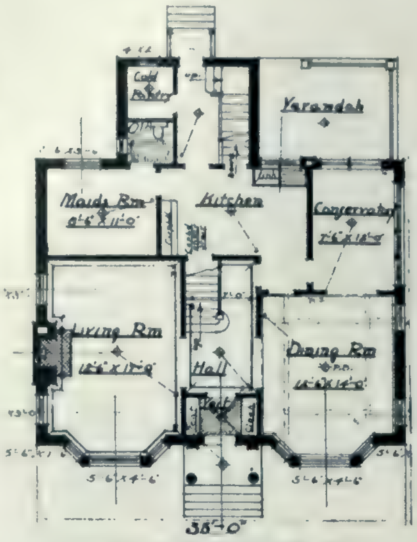
SECOND FLOOR PLAN, M'MURCHY RESIDENCE, TORONTO.

House No. 2, on Bellevue avenue, Westmount, has a splendid view over the city from the living room and verandah. The house is built with pressed buff brick and terra cotta slate roof.

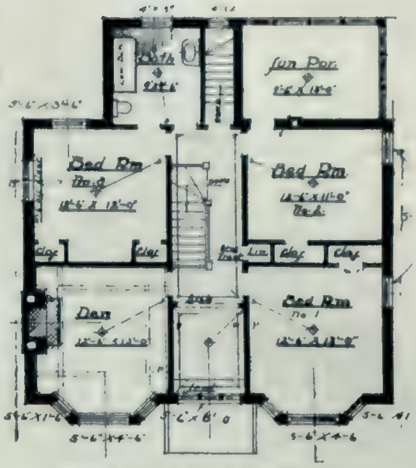
A billiard room with fireplace, and the same size as living room, is shown on the basement plan, there also being a maids' bathroom in the cellar. The first floor arrangement is very convenient, while the second floor is very compact, with no waste hall space. The living room, hall and dining room were finished in quartered oak, with quartered oak flooring and inlaid borders. The basement was plastered and painted, the billiard room finished in oak.

House No. 3, on Sydenham avenue, Westmount, was finished in oak. A maids' bathroom and billiard room are located in the basement. A den is placed off the main hall, the other side having living, dining room and conservatory connected. The bathroom, with two doors, is very convenient, as it may be used for a guest bathroom by closing one door. The billiard room in this case was finished in oak, with a brick fireplace. The bedrooms were done in cream enamel. The sun porch was heated and finished in enamel, with a shelf around at the window sills like the conservatory.

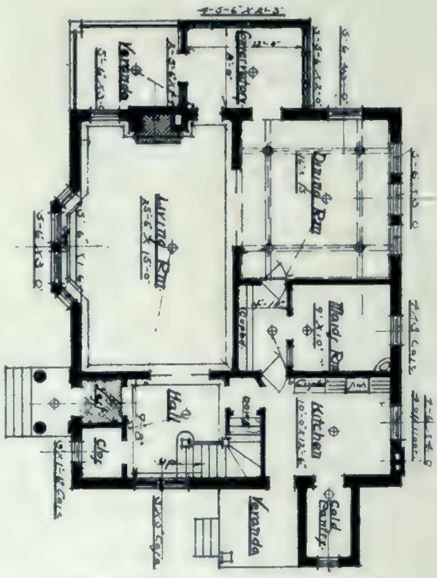
House No. 4, on Belmont avenue, Westmount, is built of grey Caledonia rough brick, lined with terra cotta, and with roof of green slate. This house is most suitable for a small family who do a lot of entertaining, there being a very large room in the basement, under the hall and drawing room, which could be used for dancing or as a billiard room. The rooms are very conveniently placed, and two sleeping porches, provided with wide openings, left, so that beds may be moved out if desired. The sleeping porches are also heated for winter use.



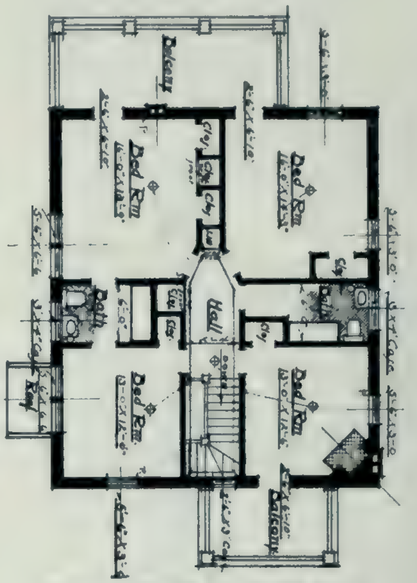
FIRST FLOOR PLAN, HOUSE NO. 1.



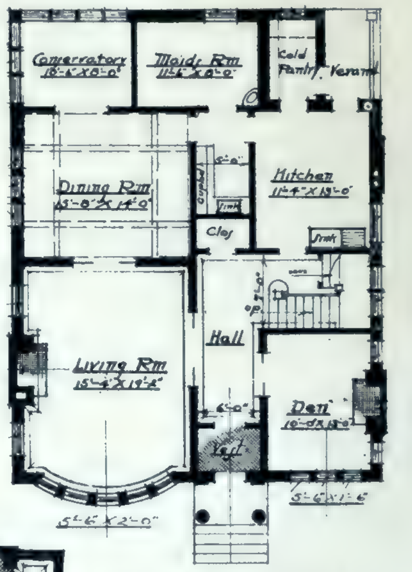
SECOND FLOOR PLAN, HOUSE NO. 1.



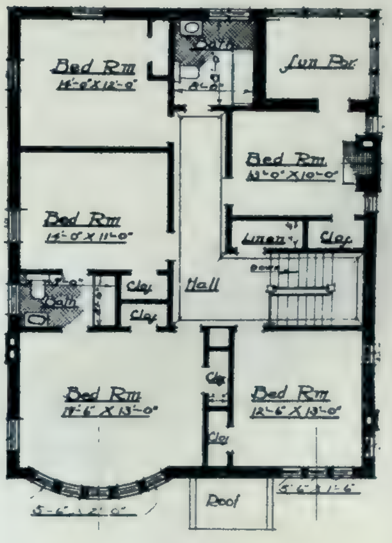
FIRST FLOOR PLAN, HOUSE NO. 2.



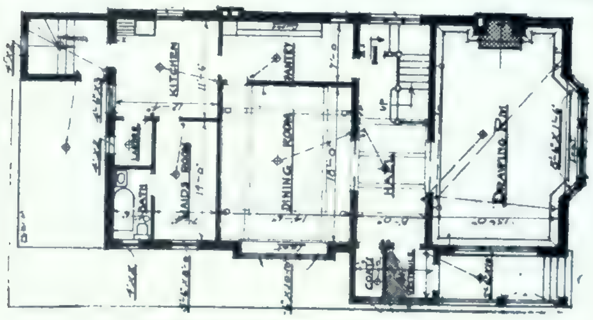
SECOND FLOOR PLAN, HOUSE NO. 2.



FIRST FLOOR PLAN, HOUSE NO. 3.



SECOND FLOOR PLAN, HOUSE NO. 3.



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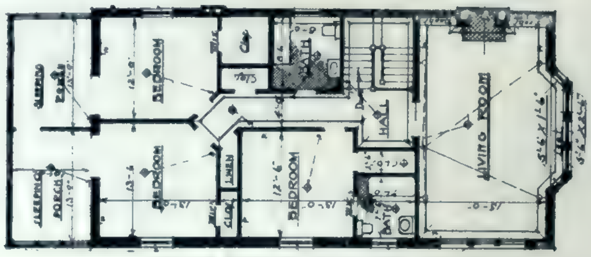
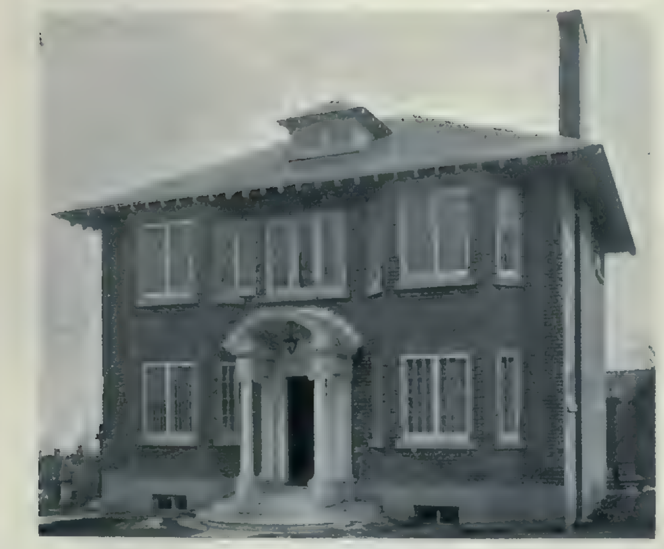
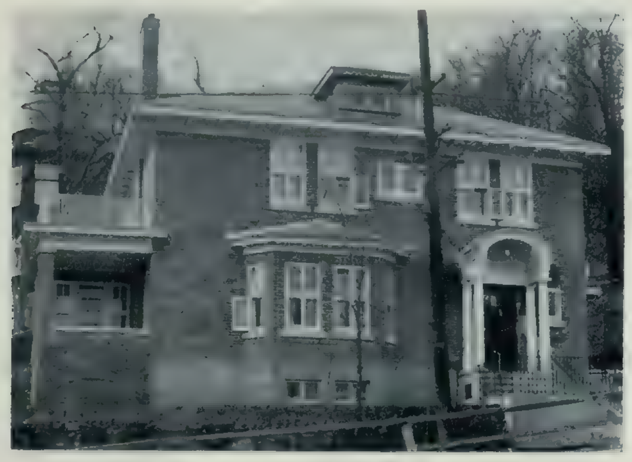


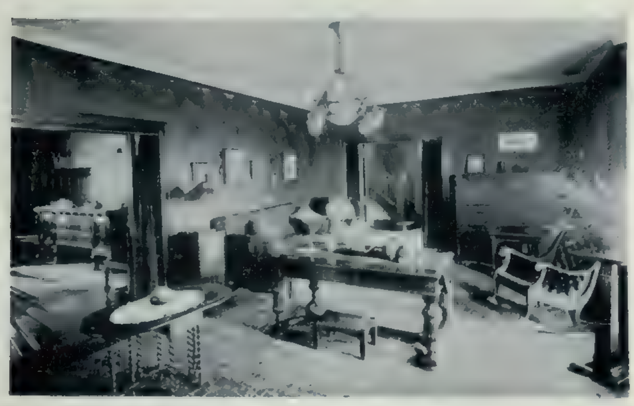
SECOND FLOOR PLAN, HOUSE NO. 4.



HOUSE NO. 1, WESTMOUNT.



LIVING ROOM, HOUSE NO. 2, WESTMOUNT.



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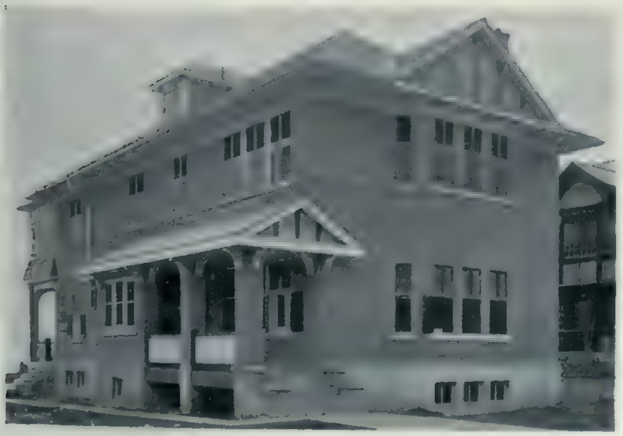

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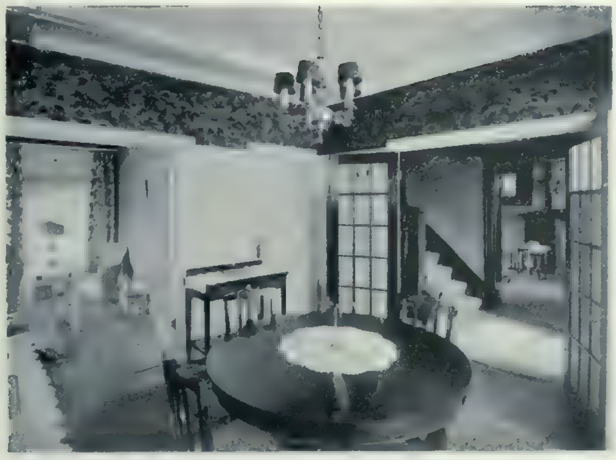
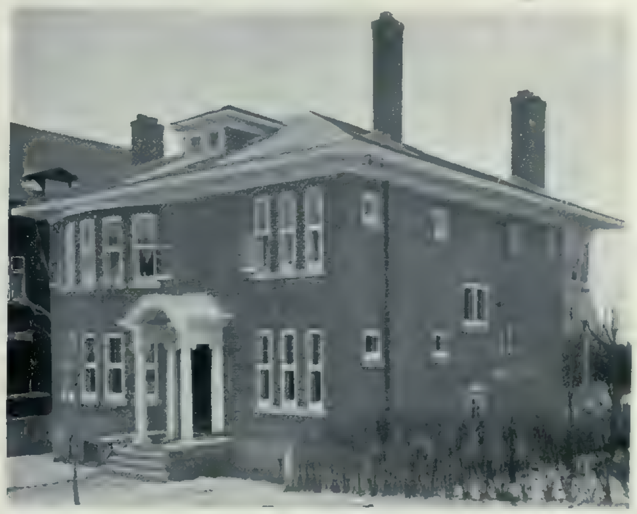
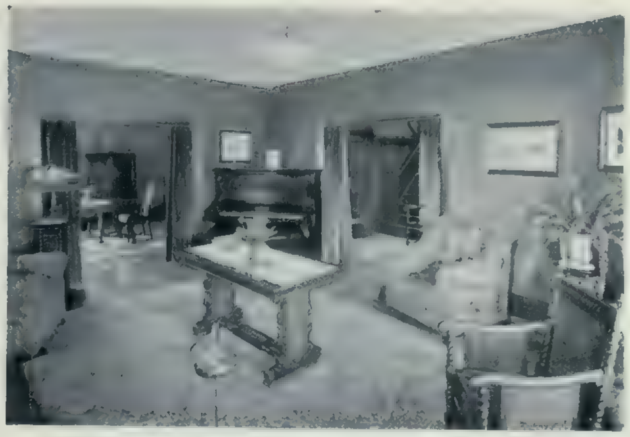


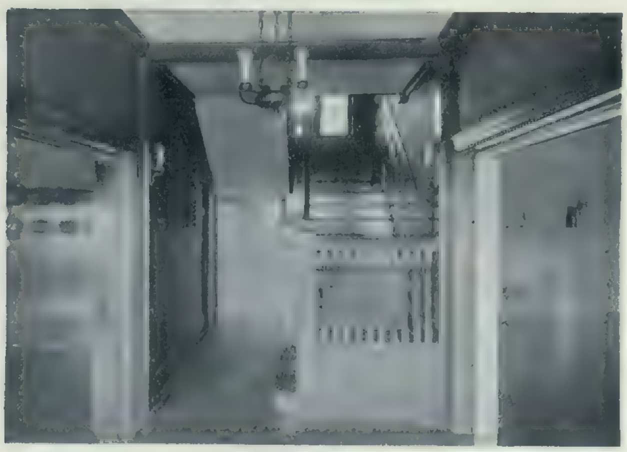
DINING ROOM, HOUSE NO. 1, WESTMOUNT.



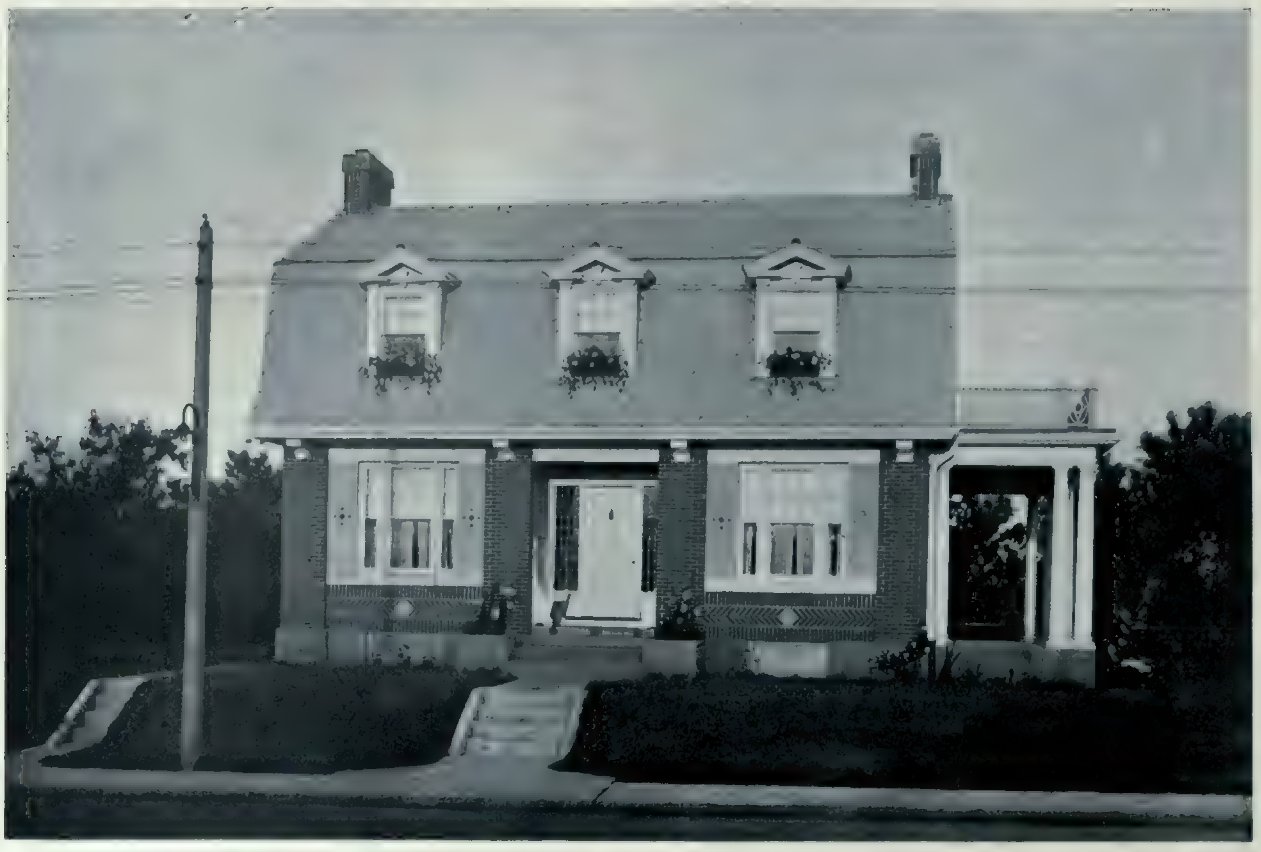
HOUSE NO. 3, WESTMOUNT.



LIVING ROOM, HOUSE NO. 3, WESTMOUNT.



HALLWAY, HOUSE NO. 4, WESTMOUNT.



COLONIAL HOUSE AT HAMILTON

This house is in the style of the Dutch Colonial, erected by the early Dutch settlers in the New England States, designed by F. W. Warren, Architect. The bricks of a pleasant red, are impervious wire-cut laid up in beach sand mortar.

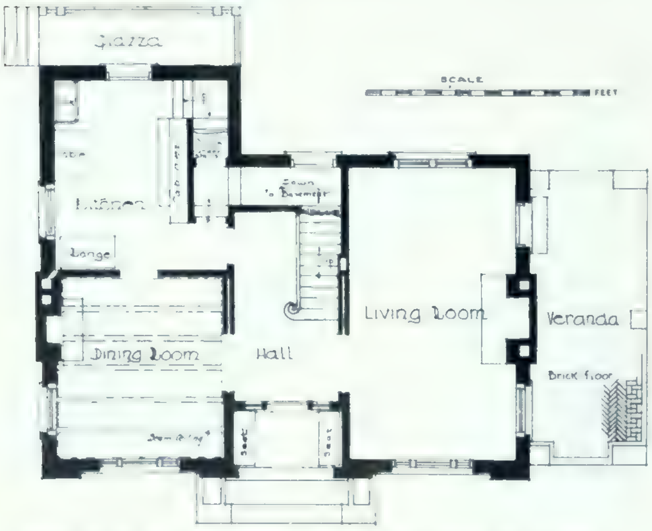
Interesting designs of brick and white stucco form attractive panels around the front windows and in the chimneys. The foundation is stone plastered and floated with cement mortar while the roof is laid diagonally of grey asbestos slate, from which protrude in front three unique dormer windows.

The interior, also Colonial, presents a very cheerful appearance. The hall is finished in white enamel with mahogany doors, and an artistic touch is added by the stained glass window on the stair landing.

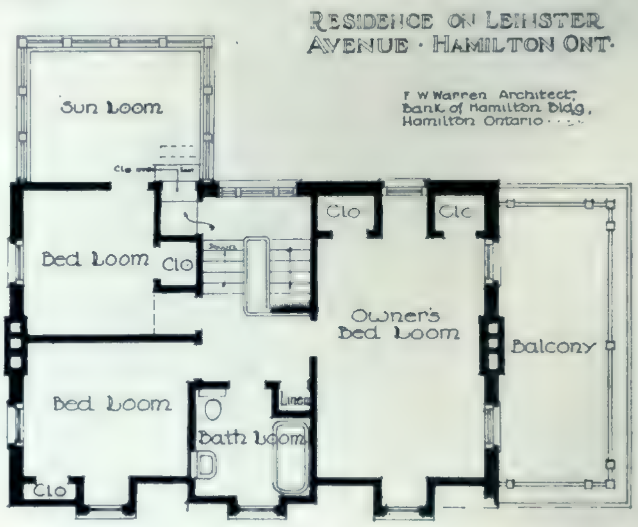
The living room and dining room are finished in stained red oak. The living room which extends across one side of the house is made exceedingly cheerful by its open tile fire-place. The door of this room opens on a large brick floored verandah which is also repeated on the second story.

The dining room also adds an interesting note with its panelled walls and beamed ceiling and also has a fire-place.

The porch in front is entirely in keeping with its two white seats, while the quaint brass knocker and side-lights in which are inserted in leaded glass the owner's coat of arms and motto, add the completing touch to the harmonious ensemble.



FIRST FLOOR PLAN, LEINSTER AVENUE RESIDENCE, HAMILTON.



SECOND FLOOR PLAN, LEINSTER AVENUE RESIDENCE, HAMILTON.

Hardware For The Moderate Priced House

By HARRY MARTIN YEOMANS

The demand for complete harmony in every detail of the modern house can be satisfied even to the key-plates and the door-knobs, for the great interest in household art and the desire for more artistic fine hardware, has resulted in the manufacturers designing and carrying in stock fine metal trimmings and ornaments to carry out decorative schemes of any of the great periods of decorative art, from the Gothic down to our own American Colonial, not to mention the modern Mission style.

The prices vary according to the style and finish from the medium-priced to the mercury-gold (gold-plaited, burned on with mercury), metal trimmings suitable only for elaborate schemes of decoration and large purses.

In common with all other details of the little house, the fine hardware should be selected with care and discrimination so that the locks and catches are of good quality, and will not speedily get out of order, but in this small article we shall be more interested in the outward appearance of the hardware, such as the escutcheons and knobs, the design of which should be suited to the general character of the house in which they are to be used. They should not be too frail-looking, neither should they be so heavy and elaborate in design that they attract attention in themselves. The door is the principal thing, and its knob and key-plate are only incidentals, and while they should be good in detail of design and workmanship, they should not attract one's notice on account of their size or elaborateness.

This general rule can be transgressed, however, with reference to the main door of the house, facing the highway, which should have an ample lock and ornamental trimming of goodly size and character for this heavier door and to denote the principal entrance to the dwelling. This lock is the defence of the home, and this main door is to keep people in as well as to keep them out.

The strap hinge of wrought iron fulfils the requirements of good design, inasmuch as it is both useful and ornamental, and it is a pity that it is not more frequently employed by architects. On the heavy entrance doors of brick houses of Elizabethan or Tudor architecture, or those showing Italian tendencies in their lines, strap hinges would be both appropriate and artistic, or on cement houses of the Mission type.

The fine hardware for the little house can be obtained in wrought or cast bronze, brass, steel or iron. It comes in a variety of beautiful and artistic finishes. The brass hardware can be obtained with either a bright or a matt surface, while the bronze escutcheons and knobs show traces of red or gold in the finish of the fine detail. A beautiful *vert antique* surface can also be obtained for schemes that require a dark-toned hardware. Some of the hardware is electrically plated, but when the basic metal is iron, it should be avoided, as the plating will wear off in a short time.

For the average small house of moderate cost, the hardware of Colonial design, in brass, is perhaps the best and most appropriate. The simplicity of design makes it available for the house that is really Colonial in detail, as well as for the house that is just "modern" with no decided architectural characteristics. One knob and escutcheon is attractive on account of its utter lack of ornamentation, while another has its plainness relieved by a simple beading around the edge, and one could not make a better selection for a small house.

For the entrance door and interior doors of Colonial houses, the manufacturers are now reproducing the thumb or lift latch which has been almost entirely abandoned in favor of the conventional knob. They come in both brass and iron. These latches are especially appropriate for remodeled farmhouses or for new houses of the farmhouse type, and should be used in connection with an old-fashioned brass or iron knocker, when placed on the entrance door.

The glass knobs should not be overlooked when the fine hardware for the house is under consideration. They give an old-time atmosphere to white painted doors, and as they can be washed, they make a big appeal for both sanitary and artistic reasons. They can be obtained both in pressed or cut glass. There are also tiny glass knobs for the inside folding shutters.

The great number of bungalows and houses of the Mission type, in all of its ramifications, which have been built within the last few years, have brought forward hardware of great simplicity of design, having a dull finish like gun-metal, and especially designed for houses of this nature.

Money spent for good hardware is never wasted, and the subject should not be dismissed as being of but slight importance. The following table is supplied by a well-known firm of manufacturers, for the guidance of the intending home builder, and gives the lowest *approximate* amount which should be allowed for the house hardware; excluding the rough hardware, such as nails, sash pulleys, sash weights, and other items of a like nature:

For houses costing	$ 3,000,	allow not less than	$ 75
" " "	4,000,	" " " "	100
" " "	5,000,	" " " "	125
" " "	6,000,	" " " "	150
" " "	7,000,	" " " "	200
" " "	10,000,	" " " "	300

The manufacturers of fine hardware issue catalogues of their products, and it is a good idea to look into the subject during the early state of one's building operations.

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Next Convention at Ottawa

The Executive Council of the Royal Architectural Institute of Canada met at the Chateau Laurier, Ottawa, on Saturday, April 28, those present being:

J. P. Ouellet, President, Quebec; A. Frank Wickson, Vice-President; C. H. Acton Bond and J. P. Hynes, all of Toronto; Alcide Chausse, Hon. Secretary, and A. Beaugrande-Champagne, Montreal; J. W. H. Watts, Treasurer, and C. P. Meredith, Ottawa, and W. D. Cromarty, Edmonton.

After considerable discussion, in which Hamilton and other places were considered, it was decided to hold the tenth annual convention of the Institute at Ottawa, on Monday and Tuesday, October 1 and 2.

A vote of $100 was made to cover expenses for a die for the medals to be given by the Royal Architectural Institute for meritorious work, three being already earned in connection with the Halifax Memorial Tower competition.

A request having been made by the editor of Construction for a list of institute members on active service, the secretary was authorized to compile a "roll of honor" for publication in Construction at an early date.

◆

Optimistic Outlook For Canadian Building.

Some idea of the increasing war-time activity in the Toronto building trade is gained by the building permit figures for the first three months of 1915, 1916 and 1917. During the first three months of 1915 permits with a total value of $779,281 were issued. During the corresponding period in 1916 the total value of permits issued was reduced to $663,789. During the first three months of 1917 these figures have been increased to $1,383,105. That all the money earned in the munition factories by the workers is not being wasted is demonstrated by the fact that a large number of houses have been erected near these factories.

In other cities throughout Canada similar increases are noted, and while there has been some hesitancy about going ahead with some buildings on account of high cost of materials, the scarcity of houses is compelling a change in this viewpoint. Although Toronto has lost tens of thousands of population owing to enlistments for overseas and removal of families to Great Britain, it is almost impossible to obtain either houses or apartments to-day, this being due to incoming population employed in munition manufacturing, etc.

A Montreal builder, interviewed by Construction, expressed his optimism by pointing out that "for a considerable time people have been wanting to build, but they have hesitated because they felt that prices were high and that they would have to come down. Now they have begun to realize that prices will not be lower for years, if ever, and the necessity for houses is going to result in a burst of building. People will become used to the prices which are now called high. The prices of building materials have been ridiculously low in the past, and there had to be a readjustment. I can see nothing but the biggest sort of a building boom. Montreal and Canada have a wonderful future, and I do not know any city or any country where I would rather be situated for the next few years than here."

◆

Great Increase in Immigration.

During the first three months of 1917 the movement of settlers into Manitoba, Saskatchewan and Alberta has exceeded the combined number for the corresponding periods of 1915 and 1916. A statement for the three months ending March 31 follows:

	1914.	1915.	1916.	1917.
January	1,157	402	392	1,177
February	1,175	391	462	1,148
March	5,253	1,025	1,551	5,148

The incoming population is of the very best farming class from the United States, and the record shows that the settlers who have come into the West from the United States since the beginning of the year brought with them $1,306,960 in cash, and $444,156 in effects.

In addition to this influx from the south, there has been a considerable migration westward from the Province of Ontario. In January, 31 carloads of settlers' effects passed through this city from old Ontario. In February 65 carloads were recorded, and in March the figures had increased to 500 carloads. These arrivals do not include men coming into the country as farm laborers, over 2,800 of whom have entered Western Canada from the United States since New Year's.

The number of immigrants admitted into Canada during the fiscal year 1916-17 was 73,395; of these 8,282 came from the United Kingdom, 2,935 from the continent of Europe, and 61,389 from the United States.

◆

Canada's Trade Shows Large Increase.

Canada's customs revenue during the fiscal year, which closed on March 31, amounted to $145,949,107. It exceeded the total for the year ending March 31, 1916, by $43,339,486, and constituted a record for the Dominion. The customs receipts for the month of March were $15,209,118, as compared with $10,663,234 in March, 1916, an increase of $4,545,884.

◆

American Building Materials For France.

Since the United States joined the Allies, a $40,000,000 contract has been closed for the reconstruction of important buildings in the ruined sections of France. The bulk of the material will be purchased in the United States. The contract is said to be the first which has been let for reconstruction purposes, and is a mere beginning. The probabilities are that the requirements for years after the war will exceed the producing capacity of the world, so that, economic alliance or not, Canada stands a good chance to get all the business she can attend to.

◆

Lt.-Col. W. W. Stewart Killed in Action

A brief cable announcing that Lieut.-Col. W. W. Stewart, of Stewart & Witton, architects, Hamilton, had been killed in action was received at Hamilton, April 19.

Walter W. Stewart was born at Covington, Kentucky, 46 years ago. While a boy his parents moved to Hamilton, and he, after education in Toronto, studied architecture there, later becoming a partner of his father, Wm. Stewart, who was then one of the best known architects of that city. On the death of his father, Col. Stewart went to Cleveland, Ohio, where he practised the profession, returning to Hamilton about thirteen years ago to form a partnership with W. P. Witton. This partnership was highly successful, and Col. Stewart became well known and popular among members of the profession.

Military training, first with the Royal 13th Regiment and later with the 91st Highlanders, led to his being chosen to command the 86th Machine Gun Battalion, the first unit of its kind to be organized in the British Empire. In command he was very successful; with his men his wish was their desire, and it is doubtful if better spirit and discipline prevailed in any unit.

For some time after the arrival of his battalion in England he was in charge of instructional work at one of the depots, and had been in France only a few weeks before he met his death.

THE LATE LT.-COL. STEWART.

Among the many Hamilton buildings he designed are recalled the following: The new Armouries, Collegiate Institute, Thomas C. Watkins' (Right House) department store; R. McKay's department store; Thos. Myles' storage warehouse.

To know "Walter" Stewart was to like and respect him. Broad-minded, courteous and competent and cheerful always, it was a pleasure to deal with him professionally or to meet him socially. He leaves a record of which the profession, his friends and family may well be proud.

◆

Method of Fireproofing Paper.

An English patent has been taken out on a method of fireproofing paper. According to an abstract in the "Journal of the Society of Chemical Industry," in the process of rendering materials non-inflammable by means of sodium aluminum carbonate, these materials in which the proofing agent cannot conveniently be precipitated in situ, may be treated by mixing or coating with a preparation of the double carbonate.

Architectural Digest

Articles of More Than Passing Interest From Our Contemporaries

HOUSE BUILDING: PAST AND PRESENT

By M. H. Baillie Scott.

I think the modern tendency is to confine our attention too exclusively to the material aspects of the problems involved in building, and to consider the art of the matter as an entirely separate consideration, and not as the leaven which should humanize and spiritualize the whole of the enterprise. Because we rightly believe that sanitation is important, there is no reason why we should always be groping in the drains, forgetting the heavens above us. It is well that every material comfort and convenience should find its place in the modern house, but, since man cannot live by bread alone, the house should minister to something more than material needs, and should indicate some of those aspirations of the spirit which we find expressed in the old houses. The main object I have in view, then, is to indicate some of the obstacles to the realization of this ideal, and to consider how they may be removed.

Before considering house building in the past or the present, it seems desirable to get some clear conception in our minds as to what building really means to us, and in what the art of it consists.

I assume that the general modern impression about building is that in its simpler forms it is a rather dull sort of trade, and that only when it becomes elaborate and complicated does it become worthy of regard as an art. This elaborate building is popularly recognized as architecture. It is built from the designs of architects, and may be readily distinguished from ordinary building because it has certain well-recognized architectural features. It has columns copied or adapted from Greek or Roman temples according to the fashion of the day, or in buildings set apart for religious purposes it may have Gothic pinnacles and cuspings. Now all these technical matters are little understood by the people, and even the highly educated are often timid in their judgments in matters connected with building. The architects are the high priests of the mysteries of architecture, and whatever they choose to do is accepted with equal indifference and apathy by the public. Of recent years, in public buildings, the architecture based on the ponderous gloom of Roman buildings has been all the mode, and this manner is carried on concurrently with various other fashions in smaller buildings. And, meanwhile, ordinary plain building is neither studied nor understood as an art. It has never apparently occurred to anyone that ordinary plain architecture is an art. The attitude towards building and architecture, which has led to this state of affairs in the building world, is supported by many high authorities. On referring to "The Seven Lamps of Architecture," by John Ruskin, I find it assumed, as a matter of course, that building itself is unworthy of regard as art, and it only becomes architecture when it includes useless features. He says architecture concerns itself only with those characters of an edifice which are above and beyond its common use.

THE ART OF BUILDING.

Now I wish at the outset to dispute entirely this modern conception of building and architecture, and I refuse to reverence any building merely because it possesses unnecessary features and ornaments. A building is not to be transformed into a piece of architecture by mere trimmings, any more than a plain man is to be made into a gentleman by adopting a conventional garb. Let us clear our minds from all the recognized cant about buildings, and look at the realities of the situation.

The principles which underlie all arts are the same. In the art of building, considered in its broadest aspect, we shall find man engaged, not, as in literature, in arranging words on a page, but in arranging brick and stone and wood on the earth. The purpose of his work is fundamentally practical, and it becomes architecture, as writing becomes literature, not by elaboration or by ornament, or by any unnecessary trimmings, but by the skill and insight disclosed in the use of the means at his disposal. In building, as in writing, the real qualities of the work are elemental and not accessory. They cannot be extricated from fundamental construction. It is impossible to make any distinct dividing line between building and architecture. The best figure which I can put forward to illustrate my conception of building is to think of it as a plant we are growing which, if our gardening is good, may break into flower. The flower is the reward of the right kind of root culture. It may be quite unexpected and undreamt of. And this living bloom is quite a different thing from the imitation flowers deliberately copied from the classic gardens. It is evolved naturally and inevitably from the very life of the plant, and cannot be stuck on from outside. In the case of building we have no critics who understand it as literature is understood, and while the latest novel or musical comedy is the subject of expert criticism in the press, buildings are seldom considered as works of art at all. A great opportunity is therefore lost of educating the public taste in matters connected with building by the lack of recognition of the building art in the popular press. A new church is vaguely referred to as in the Early English style of architecture, and the writer is obviously unaware that Early English architecture was the expression of the soul of Early England, and that the reproduction of the same forms in modern cast-iron workmanship, according to contract, is but an empty husk compared with the genuine article it imitates. For there is all the difference in the world between an inspired creation and the imitation of an inspired creation.

SIMPLICITY THE MARK OF BEST WORK.

In trying to show that the merit of a building does not necessarily lie in the architectural features, I do not wish to suggest that all elaborate building is to be condemned, but merely that beauty in building does not necessarily consist in elaboration, and that generally a certain simplicity will be the mark of the best work. Elaboration and ornament seem to me only justifiable as the spontaneous expression of the joy of the worker—a breaking forth into song. As such it stands in the building as a kind of petrified joy, and persists as a symbol of something great indeed. In building, as I understand it, while we are bound to do honest and sound work, we are in no way bound to use elaborate ornament or architectural features, and there is no mysterious alchemy which transmutes plain building into architecture by such additions.

The fashion of the day for public buildings may be expressed in the following formula. Work out your structure in a skeleton of steel and concrete, and when this is done conceal these essential factors of the constructional scheme with a screen composed of architectural features copied out of books. The curious compound resulting from this fundamentally unsound and dishonest process is usually described as Classic architecture. But those of us who have our own conception of Classic architecture may perhaps be pardoned for not accepting it as such. Classic architecture in the modern world—and the Grand Manner of building generally—stands for pride. There is no humility in it, and the antic man postures and plumes himself at large. And the cure for all this is the proper cultivation of a sense of humor. It is much to the credit of modern life that these bombastic buildings do not interest anyone, and the only reason for their production is due to the fact that all public buildings are produced under a competitive system, in which the professors of the Grand Manner are at present the sole arbiters.

In the building of houses there is some small hope of better things, because those who still understand something of the possibilities of building as an art may find in the house a means of expressing their ideals, untrammelled by official standards. But the trend of modern thought is so largely infected by utilitarian and mechanical ideas that the general atmosphere is too often fatal to the growth of any real building art. The house is considered as merely a combination of conveniences, hot-water taps, labor-saving appliances, and so on. I have no wish to undervalue these things. They are undoubtedly of great importance. But I can never accept a hot-water tap in exchange for all those noble qualities which have been and may yet be expressed in building, and I would rather think of the house as a temple to the household gods than as a mechanical contrivance which would reduce all human activities to the single act of pressing a button. I think it was Professor Lethaby who said, "A house should be as efficient as a bicycle." That is quite true as far as it goes. But it is apt to mislead us if we suppose that the problems involved in building a house or in making a bicycle are of the same kind. The function of the bicycle is such that in making it all our doings are strictly governed by insistent conditions which admit little latitude for creative choice, and its ultimate form is the resultant of remorseless material forces. But in the building of a house no such conditions restrict us. We have to enclose and to roof over a piece of space, and subdivide this space for the purposes of habitation, and according to the usual modern formula we may allot spaces for drawing-room, dining-room, and so on. Now I do not think you can tell me of any natural law which insists on any definite size or shape for any of these apartments; and, supposing the house to be wind and weather proof, to be conveniently arranged and completely warmed and lighted, there is still a large margin for creative choice in its forms and details—in the proportion of its rooms, in the technique of its workmanship, and in the qualities of its materials. It is, then, impossible to escape from the conclusion that the creation of a house is essentially an artistic matter involving deliberate selections and rejections, not entirely subject to utilitarian restrictions; art, either good or bad, cannot be excluded from its conception and execution. And the most valuable kind of art in house building is that which is intimately associated with the proportion of its masses and the very bones of its anatomy, so that, when stripped of all its superficial adornments, its wallpapers, and its curtains, it still preserves unimpaired, if unadorned, its essential qualities.

THE BUILDING OF A HOME.

The idea that house building is merely a matter of practical utility and not, like the painting of pictures, for instance, essentially an art, leads us naturally to suppose that the modern house is necessarily, as the outcome of a long experience, especially adapted to our needs, and in every way an advance on the older houses. If we wish to obtain the greatest efficiency in a locomotive, we should not in these days be inclined to use the earlier types of engines, and we rightly prefer a Rolls-Royce motor-car to Stephenson's "Rocket," for the whole development of such means of locomotion has been a continual advance in efficiency. So the modern bicycle is better than the old boneshakers or velocipedes, as they used to be called in the days when cycling was a fearful and hazardous adventure. But there is this difference between the proper subjects for scientific study and those which are governed by artistic principles. In the former we may expect advance and improvement coincident with the material progress of civilization, but in the latter it is often found the earlier work is better than the later, and so the old picture may often be better than the latest expression in painting, and the old house better than the modern villa. Give me an old house—let it be as early in date as the twelfth century if you like—and after adding a bath and cooking range, and a few hot-water pipes, which constitute almost the only contribution to efficiency to the house that modern times have supplied, the old house shall make as good a dwelling for all practical purposes as any modern house, and in addition, as a work of art, it has a value difficult to measure or describe in words and qualities, which with all our enlightenment and knowledge we have forgotten how to produce.

In thinking of building, then, I want to try to dispel the idea that architecture is an elaborate and complicated kind of building which we in our modern enlightenment have evolved out of the darkness and ignorance of the past. I want to substitute for this conception of the building art the idea that whatever real greatness a building may possess is rooted in the essential facts of its structure. It lies in little homely everyday things and in work affectionately done.

This old way of building we have lost, and, until we can regain it, it is idle to indulge in extravagant dreams about architecture, for all true architecture grows out of good building. It cannot exist without a universal habit of good building. And do not let us imagine that art is in any way degraded or obstructed by the fact that it has to deal with practical problems such as are involved in ordinary building. Pure art, as it has been called, which lives in a dream world apart from the actualities of our daily life, soon becomes emasculated and trivial, practised by a limited cult of superior persons. If we consider the works of Nature, we shall find no pure art there. The most beautiful creations all have their practical functions to perform. There is no part of the trees or flowers which is not designed for a purpose to which it is delicately adjusted, and in the human frame the beauty of eye would be nothing without sight, the arm nothing without might. Beauty in all these cases cannot be extricated from its connection with practical functions. If art is to have any real significance it must cling closely to life, and be the informing spirit in all man's doings in the world, and its central task must be concerned with the creation of houses with all the appointments of daily life.

The idea that there is something vulgar in usefulness, and that art is only to be concerned with useless tasks, is a doctrine which flourished in Victorian days. It is a doctrine which is dying hard to-day. It is a doctrine which is refuted by every old English town and village and by all the treasures of our museums, while the fruits of it are seen in the manifold ugliness of modern life. Let us hope that art may be again what it has been in the past, the reward of all constructive labor, and not only the possession of a few, so that the craftsman may recapture some of that dignity and joy of life which was once his portion and his heritage.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

Residence of F. B. Robins, Toronto.

Boiler and Radiators, Gurney Foundry Company, Toronto.
Billiard Tables, Brunswick, Balke, Collender Company, Toronto.
Carpets and Rugs, Murray-Kay Company, Toronto.
Casements, S. L. Hammond, Toronto.
Conservatory and Greenhouse, Glass Garden Builders, Toronto.
Decorating, Elliott & Sons, Toronto.
Draping, Elliott & Sons, Toronto.
Electric Fixtures, F. C. Henderson, Toronto.
Furniture, Elliott & Sons, Toronto.
Furniture, Ridpath Cabinet Shop, Toronto.
Hardware, Belleville Hardware and Lock Mfg. Co., Belleville, Ont.
Hollow Tile, Sun Brick Company, Toronto.
Interior Woodwork, Trick & Company, Oshawa, Ont.
Mason Contractors, Elgie & Page, Toronto.
Mantels, Standard Mantel and Tile Company, Toronto.
Paints, Brandram-Henderson Co., Montreal.
Plumbing Contractor, W. J. McGuire, Toronto.
Plumbing Fixtures, Imperial Products, Toronto.
Plaster Work, A. D. Grant, Toronto.
Plaster Work (ornamental), W. J. Hynes, Toronto.
Roofing Tile, Ludowici-Celadon Co., Chicago.
Roofing Contractor, A. Matthews, Toronto.
Telephone System, Bell Telephone Company, Toronto.
Valves, Jenkins Brothers, Montreal.
Varnishes, Pratt & Lambert Company, Bridgeburg, Ont.
Vacuum Cleaning System, United Electric Company, Toronto.
Water Service System, National Equipment Company, Toronto.

Residence of Ralph Connable, Toronto.

Boiler (Spencer), Waldon Co., Ltd., Toronto.
Billiard Tables, Brunswick, Balke, Collender Co., Toronto.
Decorating, J. McCausland & Son, Toronto.
Electric Fixtures, Geo. J. Beattie, Toronto.
Enamels, Pratt & Lambert Co., Bridgeburg, Ont.
Hardware, Canada Hardware Co., Toronto.
Heating Contractors, Bennett & Wright, Toronto.
Hollow Tile, Sun Brick Co., Toronto.
Interior Woodwork and Mantels, J. C. Scott Co., Toronto.
Mason Contractors, Smallwood Bros., Toronto.
Paints, Canada Paint Co., Montreal.
Plumbing Contractor, Bennett & Wright Co., Toronto.
Plumbing Fixtures, Jas. Robertson Co., Toronto.
Plumbing Fixtures, J. L. Mott Iron Works, Montreal.
Plaster Work, Hanna & Nelson, Toronto.
Plaster Work (ornamental), A. Lincoln Cooper, New York.
Roofing Tile, Ludowici-Celadon Co., Chicago.
Roofing Contractor, A. Matthews Co., Toronto.

Residence of Morden Neilson, Toronto.

Boiler, Taylor-Forbes, Ltd., Guelph.
Carpets and Rugs, T. Eaton Co., Toronto.
Carpets and Rugs, Leron Babayon, Toronto.
Decorating, Basington Bros., Toronto.
Electric Fixtures, McDonald & Willson, Toronto.
Hardware, Toronto Hardware Co., Toronto.
Hollow Tile, Sun Brick Co., Toronto.
Mason Contractors, Gordon Bros., Toronto.
Paints, A. Muirhead Co., Toronto.

Residence of R. D. Kilgour, Toronto.

Artificial Stone, Cement Products Co., Toronto.
Boiler and Radiators, Dominion Radiator Co., Toronto.
Casements, Batts, Ltd., Toronto.
Conservatory and Greenhouse, Lord & Burnham, Toronto.
Decorating, A. H. Watkins, Toronto.
Electric Contractor, Douglas Electric Co., Toronto.
Flooring, Seaman, Kent Co., Meaford.
Flooring, Builders' Moulding Co., Toronto.
Hardware, W. Walker & Son, Toronto.
Interior Woodwork, Batts, Ltd., Toronto.
Mason Contractors, John Aldridge & Son, Toronto.
Plumbing Contractors, Jas. Robertson & Son, Toronto.
Plumbing Fixtures, Imperial Products, Toronto.
Plaster Work, Taylor & Nesbit, Toronto.
Plaster Work (ornamental), Taylor & Nesbit, Toronto.
Roofing Tile, Ludowici-Celadon Co., Chicago.
Roofing Contractor, Robt. Rennie, Toronto.
Tile Work, T. Eaton Co., Ltd., Toronto

Residence of Dr. Helen MacMurchy, Toronto, Ont.

Boilers, Warden-King Co., Montreal.
Elevator, Otis-Fensom Co., Toronto.
Hardware, Aikenhead Hardware, Toronto.
Interior Woodwork, E. E. Woodley, Toronto.
Plumbing Fixtures, Port Hope Sanitary Mfg. Co., Port Hope.
Plaster Contractor, Wm. Warren & Sons, Toronto.
Radiators, Gurney Foundry Co., Toronto.

Residence of George H. Shaw, Toronto, Ont.

Boilers, Warden-King Co., Montreal.
Casements, S. L. Hammond, Toronto.
Electric Fixtures, R. A. L. Gray, Toronto.
Hardware, Canada Hardware Co., Toronto.
Interior Woodwork, Robinson & Wilson, Toronto.
Plumbing Fixtures, Imperial Products, Toronto.
Plaster Contractors, John Boyce & Son, Toronto.
Radiators, Gurney Foundry Co., Toronto.
Stone, John Vokes & Son, Toronto.
Tile, Lautz—Dunham Co., Toronto.

Residence of Thos. Fussell, Toronto, Ont.

Brick, Ontario National Brick Co., Montreal.
Hardware, W. Walker & Son, Toronto.
Heating System, C. A. Dunham Co., Toronto.
Interior Woodwork, Wm. Slater, Toronto.
Plumbing Fixtures, Port Hope Sanitary Mfg. Co., Port Hope.
Plaster Contractor, J. J. Connor, Toronto.
Tile, Canada Glass Mantels and Tiles, Toronto.
Vacuum Cleaner, United Electric Co., Toronto.

Residence of Harry Fussell, Toronto, Ont.

Brick, Ontario National Brick Co., Montreal.
Boilers, Gurney Foundry Co., Toronto.
Hardware, W. Walker & Son, Toronto.
Interior Woodwork, E. E. Woodley, Toronto.
Plumbing Fixtures, Imperial Products, Toronto.
Plaster Contractor, Hanna & Nelson, Toronto.
Radiators, Gurney Foundry Co., Toronto.
Stone, Hibbert & Newcombe, Toronto.
Tile, Canada Glass Mantels and Tiles, Toronto.
Vacuum Cleaner, United Electric Co., Toronto.

Residence of L. C. Webster, Montreal, Que.

Boiler and Radiators, Steel and Radiation, Toronto.
Casements, MacFarlane & Co., Montreal.
Decorating, Goodwins, Ltd., Montreal.
Electric Fixtures, McDonald & Willson, Montreal.
Flooring, Wood Mosaic Co., Montreal.
Mantels, G. R. Locker Co., Montreal.
Marble, Missisiquoi Marble Co., Montreal.
Plumbing Contractors, Jas. Robertson & Son, Montreal.
Plumbing Fixtures, Twyfords, Ltd., Montreal.
Roofing Contractor, Geo. W. Reed Co., Montreal.
Venetian Blinds, Henry Morgan & Co., Montreal.

Residences (Group) at Westmount, Montreal.

Boilers, Waldon & Co., Toronto; Warden-King Co., Montreal; Gurney Foundry Co., Toronto, and Taylor-Forbes Co., Guelph.
Brick, National Brick Co., Montreal.
Casements, R. McFarlane Co., Montreal.
Electric Fixtures, McDonald & Willson, Montreal.
Hardware, Durand Hardware Co., Montreal.
Plumbing Contractors, Anglins, Ltd., Montreal.
Roofing Contractor, Geo. W. Reed Co., Montreal.
Tile Work, Walker Hardware Co., Montreal.
Terra Cotta, St. Lawrence Brick Co., Montreal.
General Contractors, Anglins, Ltd., Montreal.

Residence of Leo Page, Windsor, Ont.

Boiler and Radiators, Dominion Radiator Co., Toronto.
Carpentry, Euclid Jacques, Windsor.
Decorating, Wm. Laessar, Windsor.
Electric Contractor, J. Van Buskirk, Windsor.
Hollow Tile, National Fireproofing Co., Toronto.
Mason Contractors, Cross Bros., Windsor.
Plumbing Contractors, Pennington & Brian, Windsor.
Plumbing Fixtures, Standard Sanitary Mfg. Co., Toronto.
Plaster Work, Biggs & Wilkie, Windsor.

Residence of W. G. Henniger, Smith's Falls.

Brick, Milton Pressed Brick Co., Milton, Ont.
Boiler (Spencer), Waldon Co., Toronto.
Casements, W. C. Edwards Co., Ottawa.
Electric Fixtures, General Electric Co., Toronto.
Electric Contractor, Citizens Electric Co., Smith's Falls.
Hardware, Clark & Lewis, Smith's Falls.
Interior Woodwork, W. C. Edwards, Ottawa.
Plate Glass, Pilkington Bros., Toronto.
Plumbing Fixtures, J. L. Mott Iron Works, Montreal.
Plaster (ornamental), W. J. Hynes, Toronto.
Roofing, Asbestos Mfg. Co., Montreal.
Radiators, Dominion Radiator Co., Toronto.
Telephone System, Northern Electric Co., Montreal.
Tile, Frontenac Floor and Wall Tile Co., Kingston.
Tile Work, G. R. Locker, Montreal.
Varnishes, Imperial Varnish and Color Co., Toronto.

Residence of E. G. M. Cape, Montreal.

Roofing, Geo. W. Reed & Co., Montreal.
Plumbing, Martin J. Quigley, Montreal.
Plumbing Fixtures, J. E. Mott Iron Works, Montreal.
Boiler and Radiators, Gurney Foundry Co., Toronto.
Electric Fixtures, Tiffany & Company, New York.
Ornamental Iron Work, Dominion Architectural Iron Works, Montreal.
Tiled Roof, Ludowici-Celadon Co., Chicago.
Structural Steel, Dominion Bridge Co., Ltd., Montreal.
Terra Cotta, Montreal Terra Cotta Co., Montreal.
Plaster, Alex. Brenner, Montreal.
Paints and Varnishes, Sherwin Williams Co., Ltd., Montreal.
Hardware, Lariviere, Ltd., Montreal.
Brick, Laprairie Brick Co., Montreal.
Oak Floors, Montreal Wood Mosaic Co., Montreal.
Glazing, A. Ramsay & Son, Montreal.
General Contractors, E. G. M. Cape & Co., Ltd., Montreal.

CONSTRUCTION NEWS

Information of Special Interest to Architects, Contractors, and Manufacturers.
Construction Building Reports will Give You Up-to-date Information Every
Day on all New Buildings About to be Erected or in Course of Erection.

BUSINESS BUILDINGS.

Dundas, Ont.—P. H. Secord & Sons, Limited, Brantford, Ont., have been awarded the general contract for the erection of an office building for John Bertram & Sons, Dundas street, to cost $90,000.

Ottawa, Ont.—M. M. O'Connell, 523 Bank street, Ottawa, has been awarded the heating and plumbing contracts in a business building for the Bates Realty Company; W. E. Noffke, Central Chambers, Ottawa, is the architect. S. F. Smith, 448 McLeod street, has been awarded the carpenter contract in a bank for the Bank of Ottawa on Bronson avenue, to cost $5,000; J. & J. Taylor Company, Toronto, have been awarded the vault door contract; Frank Hunt, 115 Arlington avenue, has been awarded the plastering contract; Duford Limited, 70 Rideau street, have been awarded the painting and glazing contracts; P. Ackroyd, 416 Bank street, has been awarded the electric wiring contract; J. R. McLennan, 240 Bank street, has been awarded the heating and plumbing contracts; Holebrook & Son, 480 MacLaren street, have been awarded the mason contract; W. E. Noffke, Central Chambers, Ottawa, is the architect.

Toronto, Ont.—R. Robertson & Son, Confederation Life Building, have been awarded the general contract for the erection of a bank for the Bank of British North America, to cost $15,000, at the corner of Queen and Beech avenue; Shepard & Calvin, Excelsior Life Building, are the architects. R. C. Dancy, 153 Spadina road, has been awarded the plastering contract in an office building for the Toronto Harbor Commission, 50 Bay street, to cost $150,000; D. M. Rowe Company, 30 Atkin avenue, have been awarded the roofing contract; the Trussed Concrete Steel Company of Canada, Limited, 23 Jordan street, have been awarded the metal sash contract; the Canadian Ornamental Iron Company, 88 River street, have been awarded the iron stairs contract; A. Welch & Son, 304 Queen street west, have been awarded the plumbing contract; E. F. W. Salisbury, 49 Wellington street east, has been awarded the electric wiring contract; W. J. McGuire, Limited, 91 Jarvis street, have been awarded the sprinkler contract; the Otis Fensom Company, 50 Bay street, have been awarded the elevator contract; Chapman & McGiffin, 95 King street east, are the architects.

CHURCHES, SCHOOLS AND COLLEGES.

Bridgeburg, Ont.—Architect C. M. Borter, Main street, Niagaga Falls, is preparing plans for a school for the Public School Board for the city of Bridgeburg, to cost $23,000.

Brampton, Ont.—Architects Wickson & Gregg, Kent Building, Toronto, are preparing plans for a school for the Public School Board, to cost $25,000.

Courville, Que.—P. Levesque, 115 St. John street, Que., architect, is preparing plans for a church for the trustees of Courville, to cost $80,000.

Dauphin, Man.—K. P. Slipetz, secretary-treasurer Ethelbert S. D. No. 1021, Manitoba, has received tenders for the erection of a school.

Ellice Twp., Ont.—C. C. Rock, Brodhagen, Ont., has been awarded the general contract for the erection of a church for the St. Paul's Lutheran Congregation, to cost $8,893; Rudow & Son, Milverton, Ont., have been awarded the heating contract; Chas. Knechtel, Glick Building, Kitchener, Ont., is the architect.

Hamilton, Ont.—Architect W. G. Brown, Clyde Block, Hamilton, is preparing plans for an addition to a school for the Barton Township Council, to cost $10,000.

Hamilton, Ont.—W. Finden, 291 Catherine street north, has been awarded the mason contract in a parish hall for St. Luke's Church, to cost $12,000; Murray & Conner, 158 Victoria avenue south, have been awarded the carpenter contract; W. G. Brown, Clyde Block, Hamilton, is the architect.

Lauzon, Que.—O. Michaud, Levis, Que., has been awarded the general contract for the erection of an addition to a convent for the Sisters of Jesus-Mary, Lauzon, to cost $6,500; P. Levesque, 115 St. John street, Que., is the architect.

Niagara Falls, Ont.—The Separate School Board contemplates the erection of a school on Robert street, to cost $25,000.

Ottawa, Ont.—Plans are in preparation for a church for the Ruthenian (R.C.) Congregation, to cost $12,000.

St. Thomas, Ont.—The Board of Education for the city of St. Thomas contemplates the erection of a manual training school.

Stratford, Ont.—J. Keller, Stratford, has been awarded the carpenter contract in an addition to a school on Brunswick street, to cost $8,000; A. E. Cash, 168 Ontario street, has been awarded the painting and glazing contracts; F. Bloxam, 88 Water street, has been awarded the roofing contract; Etherington & Taylor, 38 Erie street, have been awarded the electric wiring contract; R. Marsons, Stratford, has been awarded the mason contract; W. Soeder, Stratford, has been awarded the plastering contract; Peter & Sylvester, 12 Ontario street, have been awarded the heating contract; Jas. S. Russell, Stratford, is the architect. Ponder Brothers, 21 Downie street, have been awarded the general contract for the erection of an addition to Shakespeare School, to cost $26,670; J. R. Myers & Sons, Limited, Stratford, have been awarded the heating and ventilating contracts; Jas. S. Russell, Stratford, is the architect.

Toronto, Ont.—St. Barnabas Church, Toronto, contemplates the erection of a Sunday School, to cost $50,000.

Toronto, Ont.—The Separate School Board, 67 Bond street, contemplates the erection of a school at Parkdale.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Toronto, Ont.—Gordon & Helliwell, architects, Confederation Life Building, are preparing sketches for a twenty and forty room hospital building for the Women's College, Hospital and Dispensary, 125 Rusholme road.

Trail, B.C.—Victor Blanci and Rod McDonald have been awarded the general contract for the erection of a theatre for the Trail Opera House Company, Limited, to cost $15,000.

Welland, Ont.—Ryan & Gardner, Welland, have commenced work on alterations to convert a hotel into a moving picture theatre for P. Whalley, 92 Main street, to cost $11,000.

Windsor, Ont.—Architect J. C. Pennington, Labelle Building, is preparing plans for an addition to a theatre on Wyandotte street east to cost $5,000; M. D. Armaby, 152 Wyandotte street east, is the owner.

FIRE LOSSES.

Belleville, Ont.—The Albert College building was destroyed by fire; loss $30,000.

Belleville, Ont.—Graham Company, Limited, Belleville, evaporator and office building, was destroyed by fire; loss $100,000.

Charlottetown, P.E.I.—The Riley building was destroyed by fire; loss between $58,000 and $70,000.

Gladstone, Man.—The elevators of the Echo Milling Company, Gladstone, were destroyed by fire; loss $150,000.

Halifax, N.E.—Gunn's mills on Campbell avenue were destroyed by fire.

Kincardine, Ont.—The Kincardine Lawn Bowling Club house was destroyed by fire.

Kingston, Ont.—The British Whig Publishing Company newspaper plant was destroyed by fire; loss $25,000.

Montreal, Que.—The Canadian Butter Box Company, D'Israele, Quebec, factory was destroyed by fire.

Simcoe, Ont.—The canning factory of the Dominion Canners, Limited, Hamilton, was destroyed by fire; loss $50,000.

Toronto, Ont.—The John Inglis Company, 14 Strachan avenue, annealing plant on Strachan avenue was destroyed by fire; loss $20,000.

MISCELLANEOUS.

Barrie, Ont.—The project for the erection of a garage and bicycle shop on Elizabeth street, by W. Ury, to cost $10,000, has been postponed until next year.

Fort William, Ont.—The Fegles-Bellows Engineering Company are the architects and general contractors for the erection of a grain elevator for the Western Terminal Elevator Company, to cost $89,350. D. A. Gordon, Fort William, Ont., is the architect and general contractor for the erection of a grain dryer for the Mutual Elevator Company, Limited, to cost $20,000.

Hamilton, Ont.—W. O. Sealey, 61 Hunter street west, contemplates the erection of a garage, to cost $10,000.

Hamilton, Ont.—L. Mallice, 331 Emerald street north, has been awarded the concrete contract in a garage for W. O. Sealey, 61 Hunter street, to cost $10,000; D. Hill, 535 King street east, has been awarded the carpenter contract; Richard Tope, 191 Robinson street, is the general contractor.

Hamilton, Ont.—The Hamilton Bridge Company have been awarded the steel contract in a pavilion for the Park Board, to cost $23,000; A. Stead, 148 Central avenue, has been awarded the cut stone contract; J. E. Riddell & Sons, 14 Ferguson avenue north, have been awarded the roofing contract; C. W. Chadwick, 193 King street east, has been awarded the electric wiring contract; G. J. Hutton, Bank of Hamilton Building, is the architect.

Lindsay, Ont.—Rhys Williams, Lindsay, has been awarded the mason contract in a garage for H. E. Tripp & Son, to cost $5,000; Harry Hickey, Lindsay, Ont., is the architect.

Listowel, Ont.—Plans have been prepared for a spinning mill for the Perfect Knit Mills, Limited, to cost $11,000.

London, Ont.—C. Archibald, 23 Jordan street, Toronto, has been awarded the general contract for the erection of a flour mill and grain elevator for Hunt Brothers, Talbot street south, London, to cost $100,000; Canadian Allis-Chalmers, Stratford, have been awarded the machinery contract; R. G. Wilson & Sons, 193 College avenue, have been awarded the carpenter contract; J. A. Brownlee, 385 Talbot street, has been awarded the metal work contract; T. L. Partridge, 430 Wellington street, has been awarded the plumbing and heating contracts; L. C. Fitzgerald, 585 Princess street, has been awarded the painting and glazing contracts; Watt & Blackwell, Bank of Toronto Building, London, are the architects.

Port Arthur, Ont.—J. F. Hewitson, Port Arthur, has been awarded the excavating and concrete foundation contracts in a pulp mill for the Port Arthur Pulp and Paper Company, to cost $1,000,000. T. R. H. Murphy is the chief engineer.

Port Stanley, Ont.—S. E. Willis, 765 Talbot street, has been awarded the general contract for the erection of two pavilions, to cost $25,000, for the London & Port Stanley Railway, London; Watt & Blackwell, Bank of Toronto Building, are the architects.

Saskatoon, Sask.—The Scottish Co-Operative Wholesale Society at Biggar will erect ten elevators between Saskatoon and Macklin. Norman L. Thompson, architect, Willoughby Building, has prepared a set of plans of elevators for the Goose Lake Grain and Lumber Co.

Toronto, Ont.—R. Laytner, 158 Dundas street, has been awarded the sheet metal contract in showroms and garage for A. G. Strathy, 123 Simcoe street, to cost $8,500; C. F. Till, 133 Wright avenue, has been awarded the electric wiring contract; D. C. Cotton, 54 Adelaide street east, is the architect.

Toronto, Ont.—The work on the lavatories at the Toronto Exhibition will not be proceeded with this year; G. W. Gouinlock, Temple Building, is the architect. McGregor & McIntyre, 1139 Shaw street, have prepared plans for a crane runway, to cost $10,000. W. Hughes, 216 Simcoe street, has been awarded the mason contract in an art gallery on College street for B. M. & T. Jenkins, 424 Yonge street, to cost $40,000; A. Weller & Company 54 Tecumseh street, have been awarded the carpenter contract; Sproatt & Rolph, 36 North street, are the architects. The British Cattle Supply Company, Toronto, contemplates the erection of an abattoir at the Harbor front, to cost $5,000,000.

Windsor, Ont.—R. Westcott & Company, Chambers of Commerce Building, Windsor, have been awarded the general contract for the erection of a service building for W. C. Kennedy, Chatham street west, to cost $46,000; the Houghton Elevator Company, Detroit, Mich., have been awarded the elevator contract; G. Jacques & Company, Chatham street west, are the architects.

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PLANTS, FACTORIES AND WAREHOUSES.

Canboro, Ont.—The American Natural Gas and Gasoline Oil Mfg. Co., Canboro, contemplates the erection of a plant at Canboro, to cost $125,000.

Chatham, Ont.—C. & J. Hadley, 58 Thames street, Chatham, have been awarded the general contract for the erection of a factory for Libby, McNeil & Libby, to cost $200,000.

Ford City, Ont.—Wells & Gray, Toronto and Windsor, have been awarded the general contract for the erection of an addition to the factory of the Canadian Lamp & Stamping Company, Edna street, to cost $20,987; G. Jacques & Company, Peninsular Security Building, are the architects.

Galt, Ont.—Plans have been prepared for an addition to the factory of the Newlands & Company, to cost $7,000.

Hamilton, Ont.—J. B. Nicholson, 61 Proctor boulevard, has been awarded the general contract for the erection of a coal plant for the city of Hamilton, to cost $13,600.

Hamilton, Ont.—The National Abrasive Company, Boston and Amesbury, Mass., have purchased a site for the purpose of erecting a factory in Hamilton. The Ritchey Supply Company, Toronto, are their Canadian representatives.

London, Ont.—Architect L. Carrothers, Bank of Toronto Building, London, is preparing plans for a warehouse for Leff & Company, London, to cost $9,000.

London, Ont.—McMullen, Rilly & Angus, Continental Life Building, have been awarded the heating, electric wiring contract in a factory addition for the Ford Motor Company, London, Ont., to cost $125,000; Wells & Gray, Confederation Life Building, are the architects and general contractors.

Preston, Ont.—P. H. Secord & Sons, Brantford, Ont., have been awarded the general contract for the erection of a warehouse for George Pattison & Company, to cost $18,000; J. H. Mickler, Preston, is the architect.

Simcoe, Ont.—The Dominion Canners, Limited, Hamilton, will rebuild their canning factory, which was destroyed by fire.

Toronto, Ont.—James, Louden & Hertzberg, architects and engineers, have prepared plans for an addition to the factory of the Toronto Lock Manufacturing Company on Patterson place.

Toronto, Ont.—L. E. Dowling, 167 Yonge street, has commenced work on a factory addition for the Hoyt Metal Company, 356 Eastern avenue, to cost $35,000; A. B. Ormsby Company, 48 Abell street, have been awarded the metal sash contract. Dickie Construction Company, Ryrie Building, have been awarded the general contract for the erection of a warehouse for the Canadian Aeroplanes, Limited, Dufferin street, to cost $50,000.

Toronto, Ont.—Duthie & Sons, 30 Widmer street, have been awarded the roofing contract in a warehouse for the American Radiator Company, Dominion Bank Building, to cost $40,000; A. B. Ormsby, 48 Abell street, has been awarded the steel sash contract; Sproatt & Rolph, 36 North street, are the architects. Plans have been prepared for an addition to the warehouse of the Dominion Waste Company, Paton and Brown roads, to cost $25,000. Architects Hynes, Feldman & Watson, 105 Bond street, are preparing plans for a warehouse, for Harry Rotenberg, 77 Spadina avenue, to cost $40,000. W. Harris & Company, 994 Danforth avenue, will erect a glue factory at Ashbridge's Bay.

Toronto, Ont.—The Canadian Velie Motor Car, Limited, contemplates the erection of a factory at Toronto. The Reliance Knitting Company, Limited, 665 King street west, have purchased a site for the erection of a factory. H. Rotenberg, 77 Spadina avenue, will erect a warehouse at the corner of Bay and Front streets, to cost $200,000; plans are in preparation. Raymond Construction Company, 43 Victoria street, have been awarded the general contract for the erection of a warehouse for Harry Rotenberg, 77 Spadina avenue, on Centre and Elm streets, to cost $40,000; Hynes, Feldman & Watson, 105 Bond street, are the architects. Plans have been prepared for a factory for the Roy Company, Limited, to cost $8,000.

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RESIDENCES, STORES AND FLATS.

Brockville, Ont.—Fred W. Clow, Brockville, has been awarded the general contract for the erection of alterations to the store of Robert Wright Company, to cost $8,000; B. Dillon is the architect.

Hamilton, Ont.—Wm. Hobbs & Son, 313 Emerald street north, have been awarded the general contract for the erection of a store for G. Brown, Athol, Nova Scotia, to cost $7,500.

Hamilton, Ont.—Isbister Bros., 142 Emerald street south, have been awarded the mason contract in a residence for J. G. Thomson, 4 Ravenscliffe street, to cost $5,000; Donaldson & Patterson, 229 Bay street, have been awarded the carpenter contract work.

Hamilton, Ont.—W. H. Cooper, Clyde Block, has been awarded the mason and concrete contracts in a departmental store for Gracton & Company, James street north, to cost $100,000; Bremner & Penny, 344 King William street, have been awarded the carpenter contract work: J. E. Riddle & Son, 14 Ferguson avenue north, have been awarded the roofing contract; the Hamilton Bridge Works Company, Limited, Depew street, have been awarded the steel contract: G. J. Hutton, Bank of Hamilton Building, is the architect.

Hamilton, Ont.—Mitchell & Riddell, 115 Florence street, have been awarded the general and mason contracts in an apartment house for W. W. Willison, to cost $11,000; D. T. Phillips, 25 West avenue north, has been awarded the carpenter contract; Herbert Brothers, 66 Wentworth street north, has been awarded the stone contract; the Hamilton Bridge Works, Hamilton, have been awarded the steel contract; Hill Brothers, 307 Emerald street north, have been awarded the plastering contract; P. Thompson, 13 Walnut street north, has been awarded the painting contract; Culley & Braey, 35 King street west, have been awarded the electric wiring contract; Staunton & Mitchell, 173 York street, have been awarded the heating and plumbing contracts; Walter Scott, Sun Life Building, is the architect.

Mimico, Ont.—Architect W. Hunt, Confederation Life Building, is preparing plans for a residence for Cox & Cummings, Canada Life Building, to cost $6,000.

Port Colborne, Ont.—Architect C. M. Borter, Niagara Falls, Ont., is preparing plans for a residence for Miss Milligan, Port Colborne, to cost $6,000.

Ottawa, Ont.—H. L. Allen, 377 Somerset street, has been awarded the electric wiring contract in an apartment for Miss H. A. Clemow, 260 Bank street, to cost $26,000; C. H. Statta, 209 Pretoria street, is the general contractor; Taylor & Horwood, Castle Building, are the architects.

Ottawa, Ont.—A. Gauthier & Company, 247 Dalhousie street, Ottawa, have been awarded the plumbing and elevator contracts in alterations to a teachers' residence, to cost $45,200; L. Lemieux, 140 Laurier avenue, and Hector LeBlanc, Kent street, Hull, Que., are the general contractors; J. Chene, 163 Notre Dame street, Hull, Que., is the architect.

Ottawa, Ont.—Holbrook & Son, Ottawa, have been awarded the mason and concrete contracts in an addition to the store of Chas. Ogilvy, Limited, Rideau street; W. Adamson, 126 Sparks street, has been awarded the carpenter contract; Frank Hunt, 150 Arlington avenue, has been awarded the plastering contract; Duford, Limited, 70 Rideau street, have been awarded the painting and glazing contracts; J. D. Sanderson, 507 McLeod street, has been awarded the roofing contract; J. A. Ellacott, 226 Bank street, has been awarded the electric wiring contract; J. T. Blyth, Frank street, has been awarded the heating and plumbing contracts; McKinley & Northwood, 56 Rideau street, are the tinsmiths; W. E. Noffke, Elgin street, is the architect.

Sudbury, Ont.—Architect P. J. O'Gorman, Sudbury, is preparing plans for stores and apartments for Louis Prete, Sudbury, to cost $9,000.

Toronto, Ont.—Plans have been prepared for a residence and garage for W. P. Levack, 519 Roxton road, to cost $5,000. Plans have been prepared for a residence for Wm. Dickie, 22 Lytton avenue, to cost $6,000.

Toronto, Ont.—Plans have been drawn for a residence and garage for W. P. Levack, 519 Roxton road, to cost $5,000. Architect A. E. Whatmough, 41 Mountview, is preparing plans for a residence for himself, to cost $6,000. Daniel Mooney, 63 Lauder avenue, contemplates the erection of a residence on Palmerston boulevard, to cost $6,000.

Toronto, Ont.—Architect P. H. Finney, 79 Adelaide street east, is preparing plans for a pair of semi-detached residences for H. Pickering, 43 Meagher avenue, to cost $5,000. J. T. Moore, 30 Brookmount road, has been awarded the general contract for the erection of a residence and garage for J. C. Skene, 23 Fernwood Park avenue; P. H. Finney, 79 Adelaide street east, is the architect. Architect A. J. Stringer, 53 MacLean avenue, has prepared plans for a residence and garage for H. Mehr, 28 Leuty avenue, to cost $12,000.

Ville-Guay, Que.—Edgar Pellebier, Que., has been awarded the general contract for the erection of a home at Ville-Guay, Que., to cost $20,000; P. Levesque, 115 St. John street, Que., is the architect.

CATALOGUES and BOOKLETS

"The Modern Factory," treating of factory conditions as they are and as they should be, is the title of an important work by George M. Price, M.D., formerly director of investigation for the New York State Factory Commission, and now director of the joint board of sanitary control in the cloak, suit and skirt, and the dress and waist industries, New York City. Dr. Price has had unusual opportunities to learn at first hand the conditions and requirements for safety, sanitation, efficiency and welfare work in factories, and his comprehensive survey of industrial conditions takes in the entire country, together with numerous examples and suggestions gleaned from a trip abroad. An entire chapter is devoted to "Air and Ventilation in Factories," which was edited by Prof. C. E. A. Winslow. Another chapter deals with "Industrial Dusts and Dusty Trades," while a third is given over to "Industrial Poisons, Gases and Fumes." The book is one of special interest to owners, supervisors, hygienists and lawmakers. Cloth, 6 x 9 in. xiv—574 pages, 257 illustrations. $4.00 net. Published by John Wiley & Sons, 432 Fourth avenue, New York, or may be had through the book department of "Construction."

"Coloring Concrete."—The monotony of concrete construction may often be diversified and ornamental effects easily secured by application of simple pigments to the cement before mixing. The permanency of course is an important consideration for this work, and a number of the best colors suitable for it are enumerated in a bulletin on cement stucco issued by the Association of American Portland Cement Manufacturers. The quantities recommended will give a light shade of the desired color. About twice as large a quantity is necessary for a medium dark shade of the same color.

Mix the coloring matter thoroughly with the sand till a uniform color results and then mix with the cement. Blacks are safe colors, as a rule, but it is better to avoid experiments with cheap blacks. The carbon blacks are preferable to lampblacks, because they do not have the same tendency to float to the top during mixing. Ultra-marine blue, if of good quality, will hold its color for a number of years, and generally possesses the virtue of fading out evenly. It cannot be classed as a permanent color, as is black, brown or ochre.

Green is an unsatisfactory color to experiment with. Commercially, there is no green cement color on the market that will not fade when mixed with cement and exposed to light and weather.

OPENS BRANCH OFFICE.

Mr. Frank W. Nicolls, Architect, Temple Building, Brantford, has opened a branch office in Woodstock, Ontario.

◆

MANITOBA UNIVERSITY WANTS SAMPLES.

The Architectural Department of the University of Manitoba, Winnipeg, would be pleased to receive circulars or samples of woods, marbles, cements, paints and finishes.

◆

BUILDING CONDITIONS IMPROVE.

Vancouver reports an increase in building permits for the month of April this year of $11,219.00. The total number of permits issued for April this year is 49, having a total value of $73,824.00, while the number of permits issued in the corresponding month last year was 38, having a value of $64,605.00. Total value of building permits for the first four months this year is $233,364.00.

◆

PERSONALS.

George W. Gouinlock, architect, has moved his offices from the Temple Building to the Bank of Commerce Building, Bloor and Yonge streets, Toronto.

S. R. Sheldon, Vice-President and Chief Engineer of Sheldons, Limited, manufacturers of fans, died at Galt, Ont., on May 8. He was originally with the McEchren Ventilating Co., but later took over the business with his brother, W. D. Sheldon, and some years ago incorporated as Sheldons, Limited.

◆

CONTRACTS AWARDED.

J. H. Secord & Sons, Brantford, have awarded the A. B. Ormsby Company the hollow steel doors on the Bertram Office Building, Dundas.

W. K. McDonald, contractor, has awarded the A. B. Ormsby Company the hollow metal windows and Kalamein and tin clad doors in connection with the Maritime Telegraph and Telephone Company's new building, New Glasgow, N.S.

The Hydro Electric Power Commission have awarded the A. B. Ormsby Company the steel sash on their new fire station at Healy's Falls, Ont.

The British Forgings, Limited, have awarded the A. B. Ormsby Company the steel sash on their new plant at Ashbridge's Bay.

The Hoyt Metal Company, Eastern avenue, have awarded the steel sash to the A. B. Ormsby Company, Limited, on their new building.

George E. Mills, Hamilton, Ont., has awarded the steel sash on the Canadian Cotton Mills, Hamilton, to the A. B. Ormsby Company, Limited.

A. Lesage, Ste. Therese, Quebec, piano manufacturer, has awarded the A. B. Ormsby Company the contract for eight rolling steel doors.

◆

PLUMBING MANUFACTURERS AMALGAMATE.

Architects and the building interests generally will be interested to know that the B. O. T. Manufacturing Company, Toronto, Ont., and the Canadian Brass Company, Galt, Ont., recently amalgamated.

The Canadian Brass Company was organized in 1907, and the B. O. T. Company three years later; the first to manufacture water works and sanitary plumbing brass goods, and the latter, water closets. Both have established themselves firmly, their products being of a high quality and their service of comprehensive character.

Now the B. O. T. Company ceases to exist, and the business of the two companies will be carried on under the name of the Canadian Brass Company. B. O. Tilden, the inventor of the B. O. T. special construction bowls and tanks, will be a director of the new company. G. E. Fisher, who, previous to his becoming general manager of the Canadian Brass Company, in 1915, was in charge of pump, electric and gas engine sales for the Fairbanks-Morse Company, becomes managing director and secretary-treasurer. H. Leddon, who has been the foundry expert of the Canadian Brass Company, becomes a director, and Trevor Hawgood, who has been B. O. T. manager for Canada, will be Toronto manager. The head office will be at Galt, and the B. O. T. office at Toronto takes the new firm name. The trade names of the products of both companies will be continued.

The Board of Directors are: President, G. A. Dobbie, Galt; Vice-President, F. S. Scott, M.P.; Directors, F. A. Scott and H. Leddon, and B. O. Tilden; Managing Director and Secretary-Treasurer, G. E. Fisher; Toronto Manager, Trevor Hawgood.

◆

BIG INCREASE IN DOMINION TRADE.

Canada's total trade during the fiscal year ended March 31 last, exceeded that of the previous financial year by over eight hundred million dollars. Hon. J. D. Reid, Minister of Customs, has announced that the trade for the year recently terminated amounted to $2,249,170,171, of which $225,000,000 was in coin and bullion, as compared with $1,424,916,665, of which $140,000,000 was in coin and bullion in 1915-16.

The exports for the year 1916-17 aggregated $1,151,375,768, as against $741,610,653 in the previous twelve months. Indeed, the great growth of trade was largely due to the expansion in exports of manufactured and agricultural products.

The exports of domestic manufactures increased from $142,034,998 in the fiscal year of 1915-16 to $477,399,676 in 1916-17; agricultural products increased from $249,661,194 to $373,413,701; export of animals and their produce from $102,882,276 to $127,795,468; products of the mines from $66,589,861 to $85,616,907.

Imports grew from $507,783,361 in 1915-16 to $845,330,903. Of the imports the dutiable goods accounted for $461,708,206, and free goods for $383,622,697. The Customs revenue was $147,623,230 in 1916-17, as compared with $103,929,126 in the previous fiscal year.

◆

CEMENT.

The production of structural materials and clay products which showed a large falling off in both 1914 and 1915 shows a further decrease in 1916. The total value of the production in 1916 was $17,301,726, as against $17,920,759 in 1915, and $26,009,227 in 1914.

The total quantity of Portland cement including natural Portland, made in 1916 was 4,753,034 barrels of 350 pounds each, as compared with 5,153,767 barrels in 1915, a decrease of 400,733 barrels, or about 7.8 per cent.

The total quantity of Canadian Portland cement sold, or used during 1916 was 5,359,050 barrels, valued at $6,529,861, or an average of $1.218 per barrel, as compared with 5,681,032 barrels sold or used in 1915, valued at $6,977,024, or an average of $1.228, showing a decrease of 321,982 barrels, or about 5.7 per cent.

The total imports of cement in 1916 were 72,087 cwt., equivalent to 20,595 barrels of 350 pounds each, valued at $31,621, or an average of $1.54 per barrel, as compared with imports of 28,190 barrels, valued at $40,426, or an average of $1.43 per barrel in 1915.

The total consumption of cement, therefore, neglecting a small export was 5,379,645 barrels, as compared with a consumption of 5,709,222 barrels in 1915, showing a decrease of 329,577 barrels, or about 5.8 per cent.

The average price per barrel at the works in 1916 was $1.218 as compared with $1.228 in 1915, $1.28 in 1914, $1.27 in 1913, $1.28 in 1912, and $1.34 during 1911 and 1910.

The imports of cement in 1916 included 72,083 cwt., valued at $31,616, from the United States, and 4 cwt., valued at $5, from Great Britain.

◆

TECHNICAL SOCIETIES.

ALBERTA ASSOCIATION OF ARCHITECTS.—President, Jas. A. Henderson, F.R.I.B.A., Edmonton; Hon. Secretary, W. D. Cromarty, Edmonton.

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"Hammer Brand" Hard Wall Plaster

It neither loosens nor falls off; it allows carpenters to follow plasterers without loss of time, and lasts as long as the building.

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HILLSBOROUGH, NEW BRUNSWICK, CANADA.

THE
JACKSON-LEWIS COMPANY
LIMITED
GENERAL BUILDING CONSTRUCTION
Bell Telephone Building, Toronto

CONSTRUCTION

June, 1917 Vol. 10, No. 6

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ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL (Frontispiece) 188

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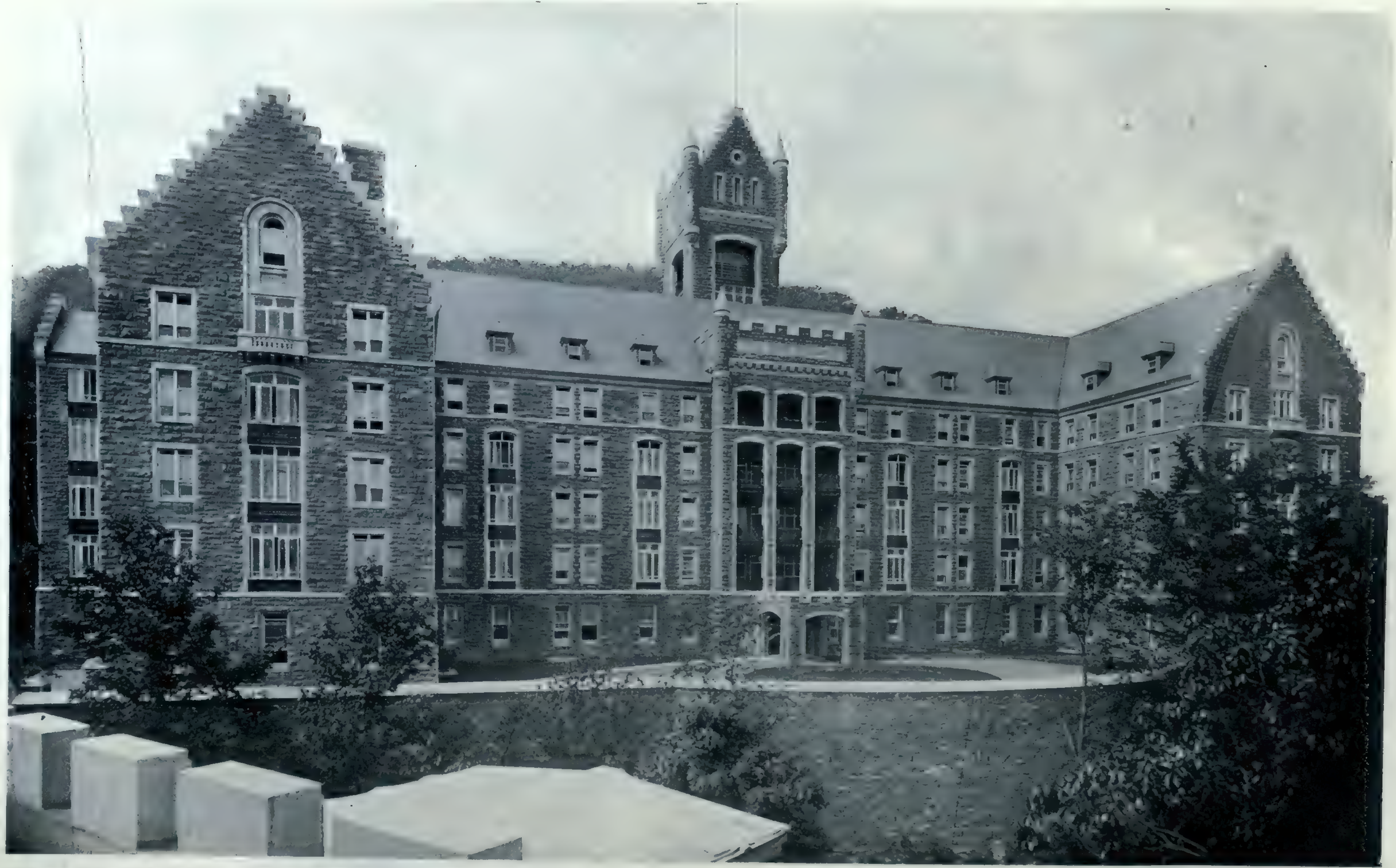


ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.

STEVENS & LEE, TORONTO, AND KENNETH G. REA, MONTREAL, ASSOCIATE ARCHITECTS.

Ross Pavilion of The Royal Victoria Hospital

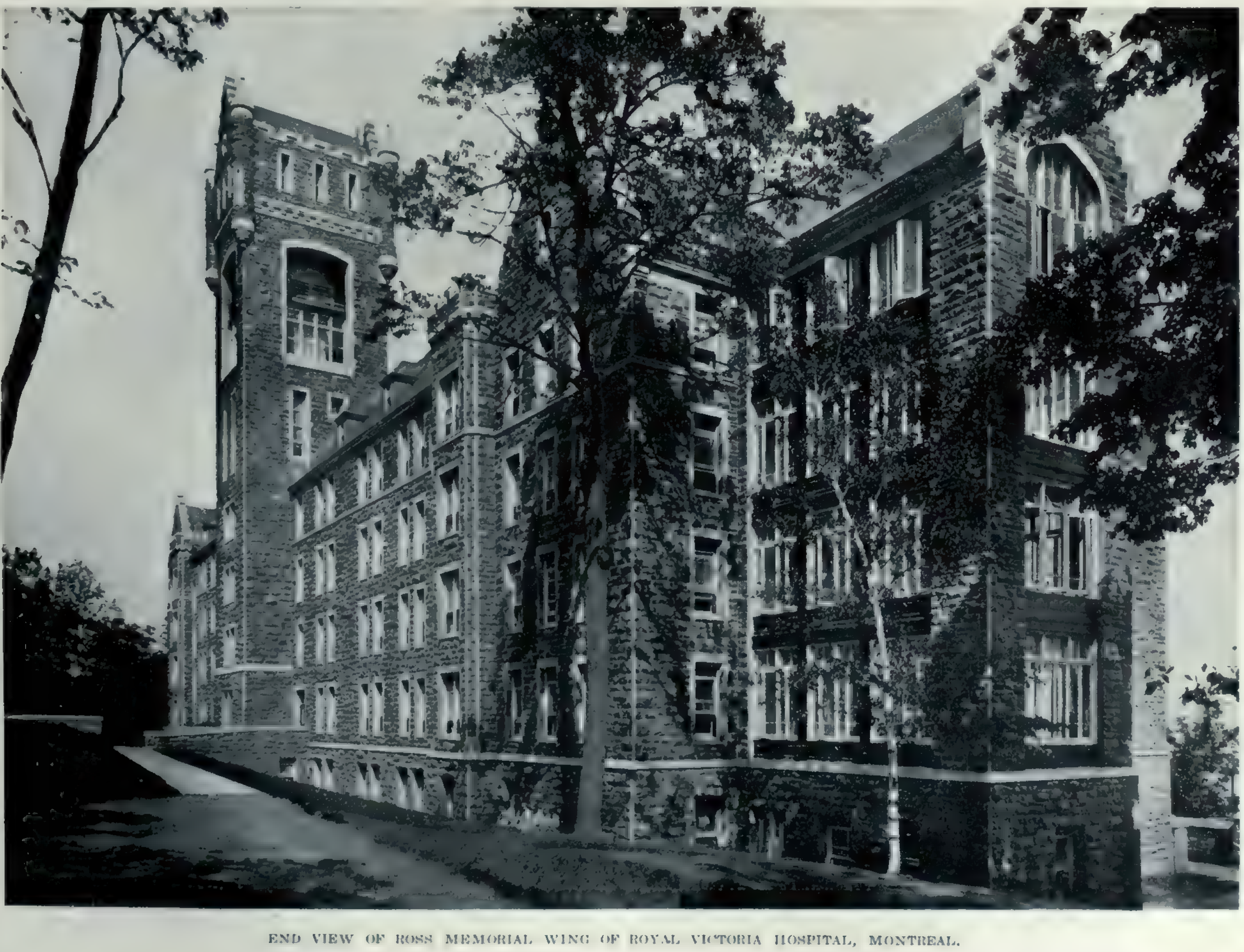
Splendid Memorial to the Late James Ross Erected on Mountain Side at Montreal.

THE development of hospitals in Canada and the United States during the past five years has been phenomenal; with three thousand hospitals in the United States and Canada in 1911, the number has grown to over eight thousand at the present time. Nowhere in the world has there been such strides in any architectural development. While the major increase has been with the small public hospitals for the poor and indigent, there has been, nevertheless, a marked growth of hospitals or pavilions for the exclusive use of those who can and are willing to pay. Nearly every large hospital to-day has its private ward pavilion, sometimes adjoining the main group, and sometimes isolated and under practically separate administration, so far as the food and nursing are concerned.

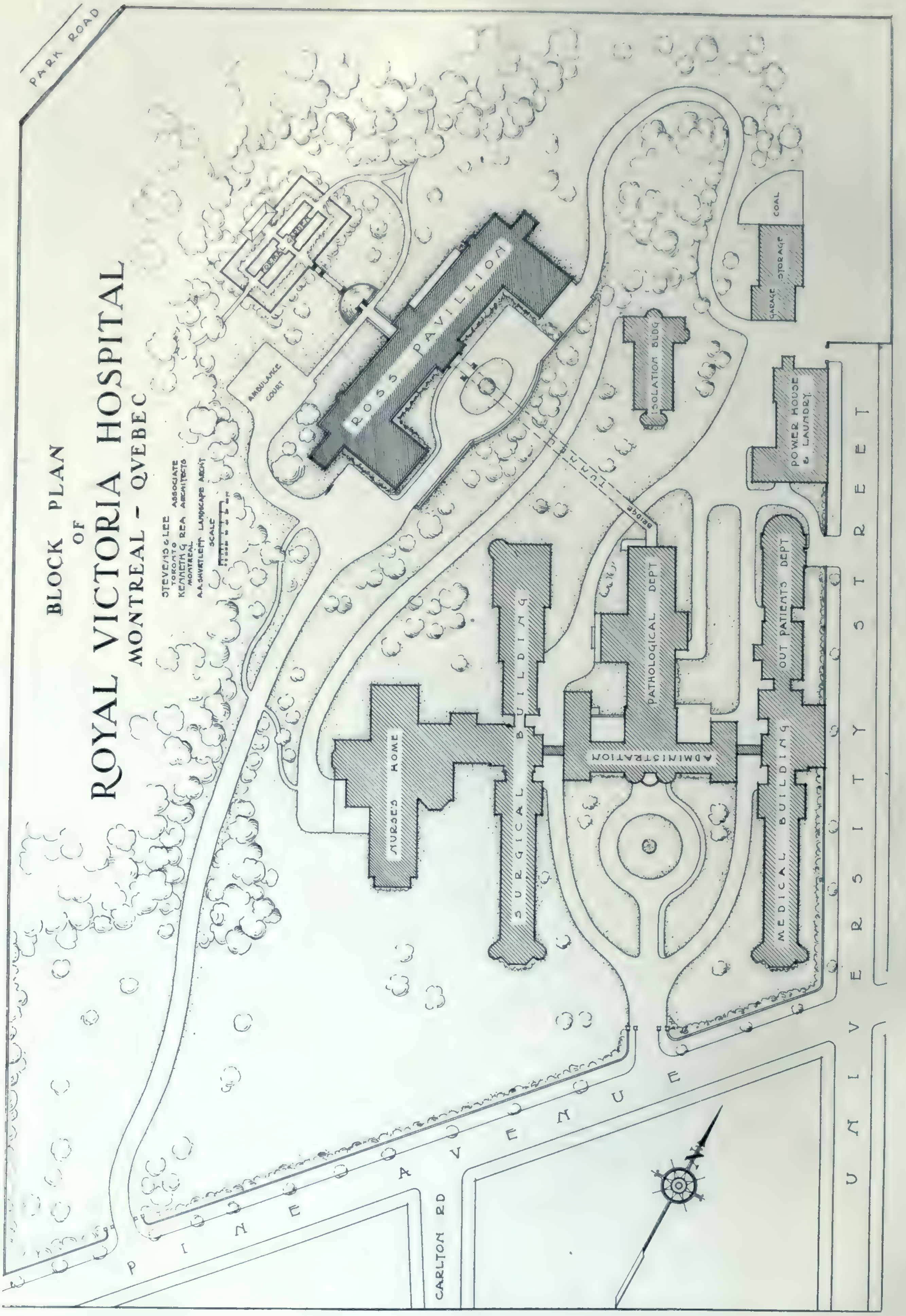
The problems and conditions given the architects of providing for one hundred and thirty private patients in the Ross Pavilion of the Royal Victoria Hospital, at Montreal, which was dedicated by their Royal Highnesses, the Duke and Duchess of Connaught, on the 11th of October, 1916, were somewhat unique.

The precipitous grade on the side of Mount Royal, where the main buildings are located, made the study of the site for the new private ward pavilion a most important factor. There was no room on the east; a location at the west on Pine Avenue would bring the new building into too close proximity with the existing group; so a location at the northwest, about three hundred feet from the present group at the edge of a plateau on the slope of the mountain, was selected.

After the selection of the site, the next problem was the approach; first, from the main hospital, and second, from the street. The first has been solved by tunnelling into the mountain, to a point directly under the staircase and lifts, and sinking a shaft to meet this tunnel, as the main floor of the new building is one hundred feet above the main floor of the original hospital. This tunnel leaves the second story of the main building, crosses a bridge, and then, with a five per cent. grade, reaches the lifts and staircase at a level of fifty feet below the ground floor. As to the second, the pavilion entrance is about



END VIEW OF ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.


BLOCK PLAN
OF
ROYAL VICTORIA HOSPITAL
MONTREAL - QVEBEC
STEVENS & LEE ASSOCIATE
TORONTO
KENNETH G REA ARCHITECTS
MONTREAL
A.A. SHURTLEFF LANDSCAPE ARCHT
SCALE
PARK ROAD
AMBULANCE COURT
ROSS PAVILLION
ISOLATION BLDG
GARAGE STORAGE
COAL
POWER HOUSE & LAUNDRY
TUNNEL
BRIDGE
NURSES HOME
SURGICAL BUILDING
ADMINISTRATION
PATHOLOGICAL DEPT
OUT PATIENTS DEPT
MEDICAL BUILDING
UNIVERSITY STREET
PINE AVENUE
CARLTON RD

ROYAL VICTORIA HOSPITAL BUILDINGS, SHOWING ROSS MEMORIAL WING IN BACK GROUND.

1,000 feet from the street entrance, which entrance is marked by heavy wrought iron gates. The main courtyard, at the east of the new pavilion, is reached by a moderate slope from the gates, and is sufficiently broad to allow the turning of automobiles and carriages. This roadway was excavated from the side of the hill along which it rises to the elevation of the new building. The patients' entrance is from a courtyard at the west, approached by a detour from the same driveway.

In connection with the patients' entrance, there is an exedra, through which is the approach to the patients' lawn and tea house. Walks lead through the natural park. This park consists of a large tract of land that will be reserved for the patients and will be developed as the needs increase. The location is such that patients will be relieved of the disturbing noises from the street or from the main hospital buildings.

The exterior of the building is designed to harmonize with the original plant. This necessitated the use of the Scotch Baronial type of architecture and the material is of rock faced Montreal limestone with cut stone quoins and ornament. Being on an elevation nearly one hundred feet above the other buildings, it naturally dominates the group when viewed from a distance. A central tower was considered a desirable architectural feature, as this makes a practical housing for elevator machinery, fans and ventilation.

The main entrance from the east court is through a porte cochere to the memorial vestibule. This vestibule has walls and groined ceiling of Caen stone and floor of marble. On the right of the entrance is the porter's window; on the left, a memorial tablet in bronze, surrounded by marble, with the inscription: "This pavilion was erected and equipped by John Kenneth Leveson Ross, to the memory of his father, James Ross, and of his mother, Annie Kerr Ross."

The first story is used entirely for administrative purposes, medical treatment, the culinery department and a small psychiatric department. The entrance hall is 26 feet by 32 feet and here the architects felt at liberty to depart from the hospital type of finish. Here there is panelled oak dado, with the upper portion of the walls of Caen stone and a panelled vaulted ceiling. At the five electric outlets in the ceiling are heavy bronze chandeliers. The heating of the room is taken care of through a central marble and oak pedestal with bronze grills which is surmounted by a tiny illuminated fountain. The floor is Belgian black and Italian white marble, with a border of Tennessee. At the right, is the general office, (back of which are the private offices) with panelled oak counter ;at the left, one of the reception rooms; directly ahead, the two lifts. These lifts lead from the tunnel, fifty feet below, to the attic of storage space, and are two in number; one a general lift for standing passengers or guests, and the other for beds, stretchers and supplies. The larger lift is so arranged that with the power trucks which will be used, patients can be taken from any part of the main building, through the tunnel, up to any floor, room or balcony in the new building.

The kitchen, located on this floor, is a model of convenience, and has every device for cooking and serving of food to this class of patients.

It is divided into three sections—scullery, where rough work and the preparation of food is done; the central portion, where all foods are cooked; and the serving portion, where the food is loaded into the food trucks preparatory to its transit to the various serveries. Connected with this department are the special dining rooms, store rooms, refrigerators and service stairs.

PRIVATE SUITE IN ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.

From the main entrance hall, through a special corridor, are the rooms for the use of the special nurses, consisting of locker room, dressing booths and baths. Adjoining the main entrance, on the south is a series of waiting and examining rooms. Locker and toilet rooms are provided near the main entrance for the accommodation of staff members.

SERVING ROOM IN ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.

On this floor is a complete Roentgen or X-Ray department, with the most modern equipment. This consists of a suite of two operating rooms, control room, developing room, view room, plate storage and toilet. A special room is set apart for the electrocardiograph, with wires extending to the different floors, so that records may be taken without moving the patient from his own bed. A large medical treatment department, consisting of the various baths — shower, needle, douche, sitz, continuous, carbon dioxide, etc. Also rooms for electric cabinets, baking and hot-packs, rest rooms, etc., are provided. A small psychopathic department, with continuous bath, is provided for the occasional need of patients requiring rest and isolation.

While there are no patients located on this first floor except the occasional psychopathic patients, the entire second, third and fourth floors, and a large portion of the fifth floor are devoted to their comfort. On the central axis of each story is a large airing balcony, of sufficient size to allow many beds and patients in wheel chairs. Connected with these balconies on each floor are the office of the head nurse and sitting room

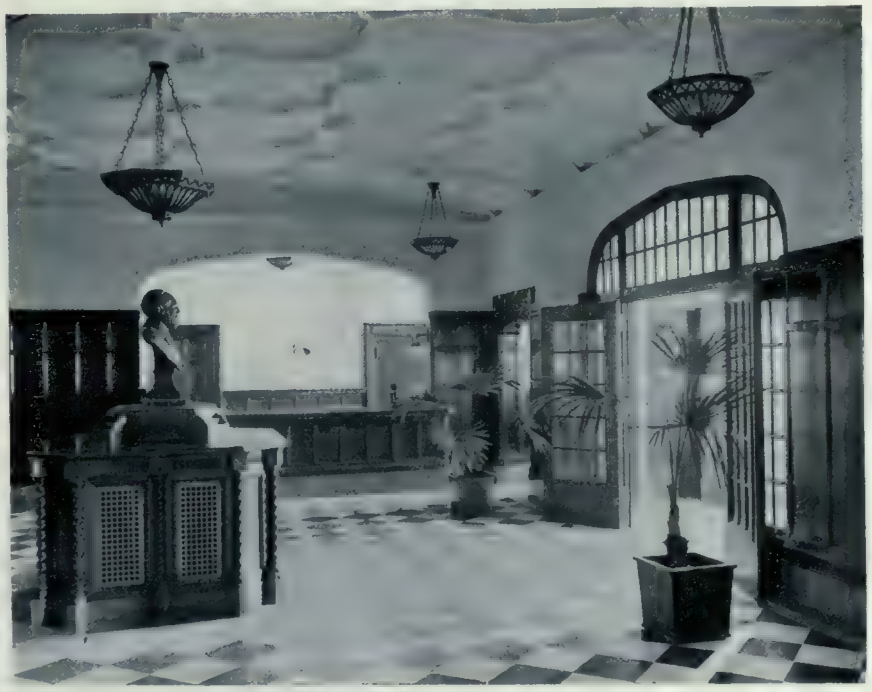
KITCHEN IN ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.

ENTRANCE GATES TO ROYAL VICTORIA HOSPITAL, MONTREAL.

for nurses. On the west side on the same axis, are located the serveries or serving kitchens, from which the individual service to each patient is taken. These serveries connect directly with the main kitchen through the service lift. There are thirty suites of two rooms, with bath and private balcony; numerous suites with bath; and large private rooms with baths adjoining. Two rooms and a bath are provided on the attic floor for special noisy cases.

The construction of the building has been carefully studied to avoid the transmission of noises from one part of the building to another and from one room to another. To that end, double floors and double partitions are built; also double windows everywhere. The entrances to all the patients' rooms are vestibuled with two doors. All latch bolts and all noisy hardware are omitted. The floors of the rooms are covered with linoleum, and the floors of the corridor with cork tile.

Careful study has been given to the decoration of the patients' rooms. Each room is provided with a special hospital lavatory, a built-in china mirror frame, surrounded by a tile and mosaic border, a semi-direct ceiling light, portable bedside light, telephone connection, nurses' call system, and a clothes cupboard, through which the room is ventilated, affording ventilation of the room and contents of the cupboard as well.



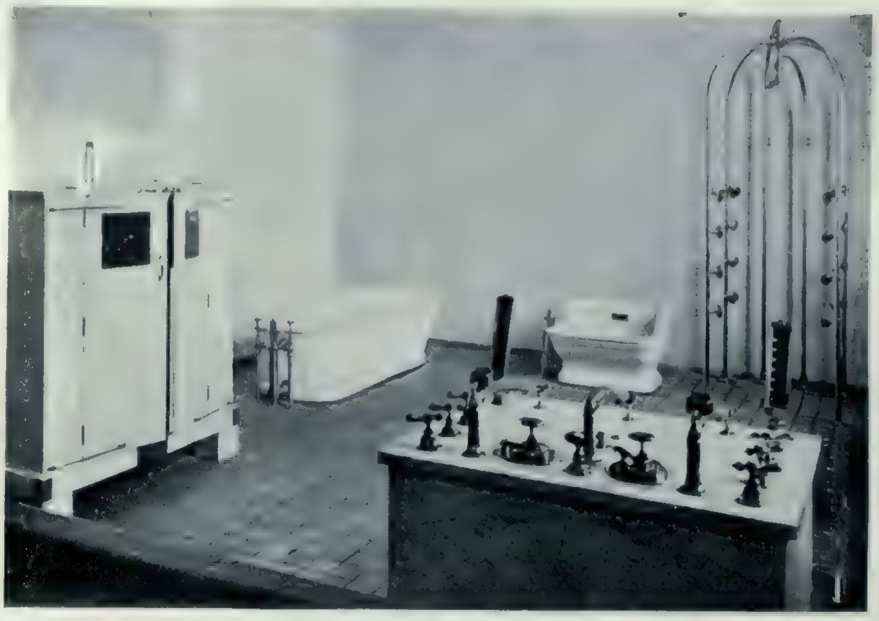
ENTRANCE HALL TO ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.

In addition to the main balcony and the private balconies, on each floor there is a large day room on the north and a solarium on the south. Sink rooms, toilets, and baths, and linen, medicine and broom closets are provided. The corridors are wide and the floors are laid in cork tile. Vacuum cleaner connections, fire hose and drinking water fountains are provided on every floor.

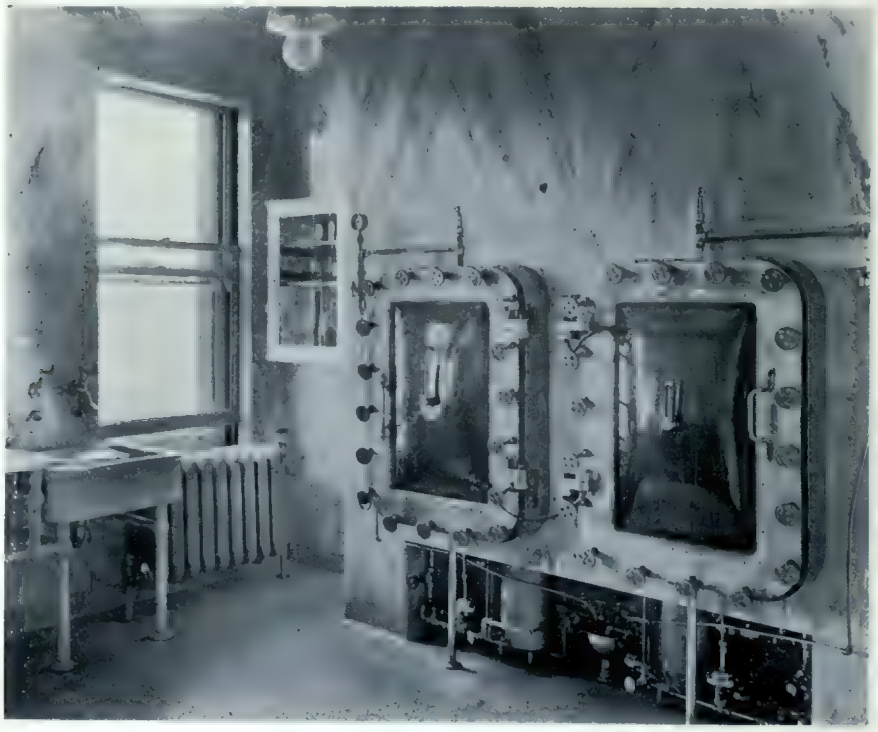
VIEW ON BALCONY, OVERLOOKING MONTREAL AND ST. LAWRENCE RIVER AT ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.

The north portion of the fifth floor is set apart for the operating department. It has been the endeavor of the architects to make this department second to none, not in elegance and expense, but in simplicity and practical results. The operating rooms have been particularly studied for the results which are here attained. The floors are of Tennessee marble; the walls of Tavernelle marble, of a tawny yellow color (selected for its softness and freedom from reflection); and the ceilings and cove of plaster, painted ivory white.

The light through the skylight is diffused by the use of special glass in the frames. The wall lights, as well as the ceiling, have a double sash, with heated air space between. The outside air is admitted, after heating, through space between the sashes. There are no radiators or exposed fixtures in the rooms themselves. These rooms are artificially lighted through wall-panelled lights and intense hydrogen lights in front of powerful reflectors above the ceiling lights. Distilled water is brought from the still, located above and reheated to any desired temperature in the room, this being the only fixture projecting beyond the surface of the walls. Built-in metal cabinets take care of supplies. A flushing floor drain provides for drainage. Compressed air, nitrous oxide, and oxygen are piped to each room.



DOUCHE ROOM, SHOWING ELECTRIC BATHS ETC.



STERILIZING ROOM IN ROSS MEMORIAL WING OF ROYAL VICTORIA HOSPITAL, MONTREAL.

In the sterilizing room, which is located between the two operating rooms, there is installed the most modern sterilizing apparatus. The dressing sterilizers, which have been especially designed for this pavilion, are built into the walls and surrounded with marble casings. These sterilizers have a special device for using superheated steam and for condensing the moisture to give dry dressings. The surgeons' scrub-up is in the open corridor. It is simple in construction, the water being turned on and off by the touch of an elbow. Here also are the built-in cabinets for hot blankets and instruments. The nurses' work room, the surgeons' dressing and locker room, the plaster room, and cystoscopic and anaesthetizing rooms, the laboratory, and orderlies' room are all here provided.

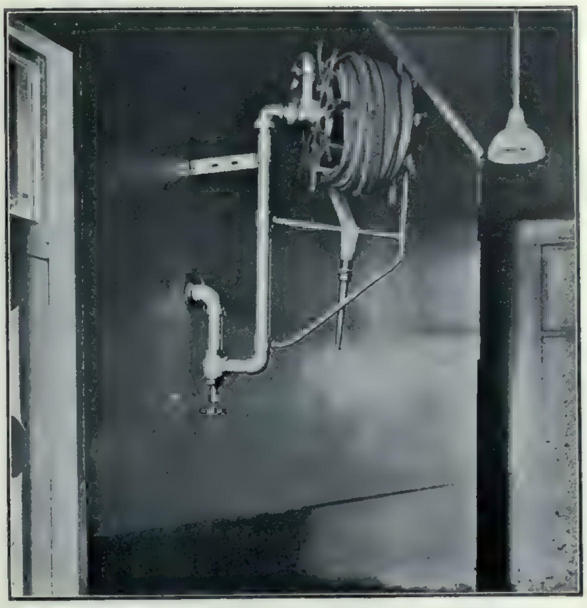
OPERATING ROOM, SHOWING RADIATORS BEHIND CASEMENTS IN ROSS MEMORIAL WING.

Distilled water is provided not only for surgical purposes, but for drinking water for the entire pavilion. A room is set apart for this plant in the attic space, and the water for drinking purposes is cooled and circulated throughout the building.

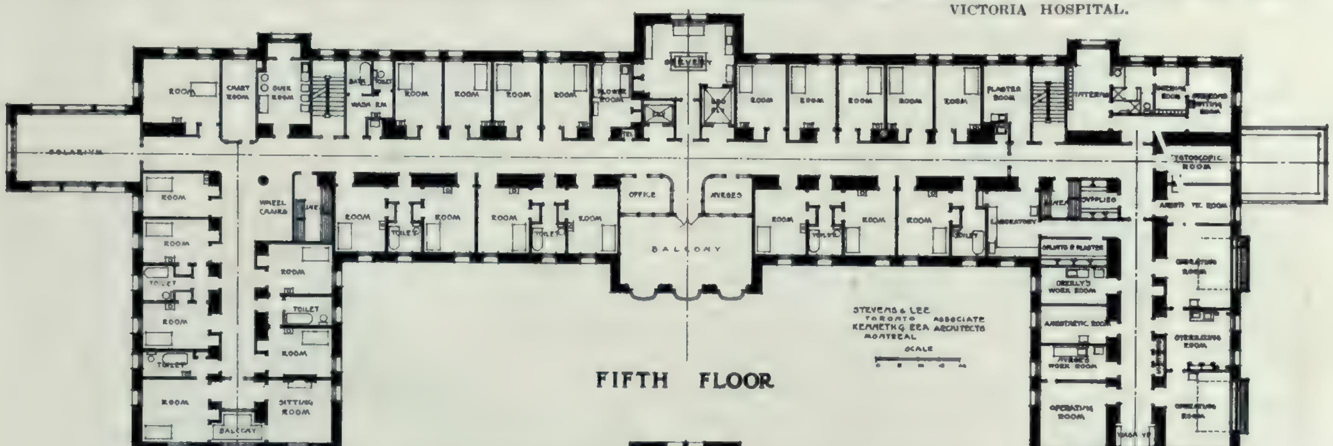
The heating is by hot water, forced by pumps from the hospital boiler plant through a special tunnel. The radiators are set away from the wall and floor, and are supported on brackets.

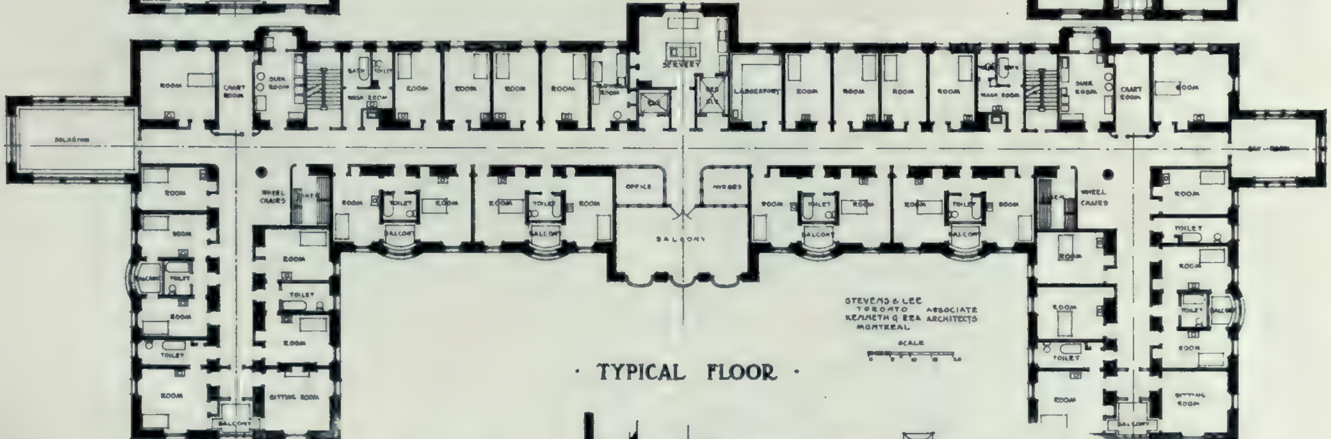
The nurses' call system consists of a locking push button on each bedside, recording the number of the room at the various nurses' stations on each floor by a silent electric light annunciator, and by a signal light over the door of the patient. In addition to this, an elapsed-time recorder, making a record of the exact time and the duration of every call, is provided in the main office of the building.

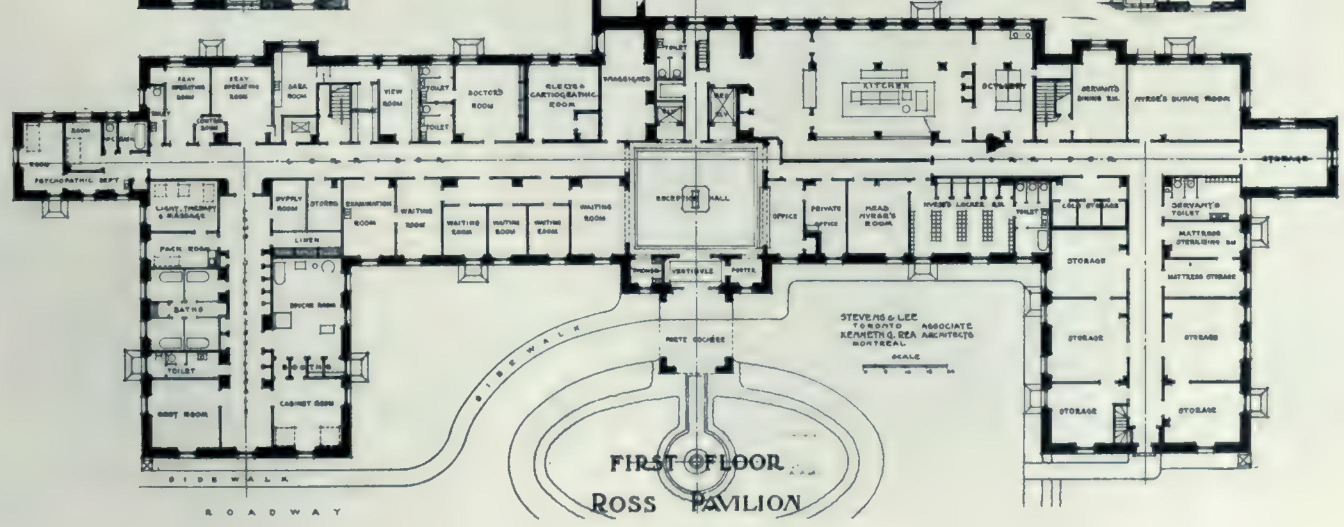
Exhaust ventilation is provided by means of fans direct connected to electric motors. The air is drawn from the rooms through tile ducts.



AUTOMATIC HOSE REELS IN ROSS PAVILION OF THE ROYAL VICTORIA HOSPITAL.







First Units of Mount Hamilton Hospital

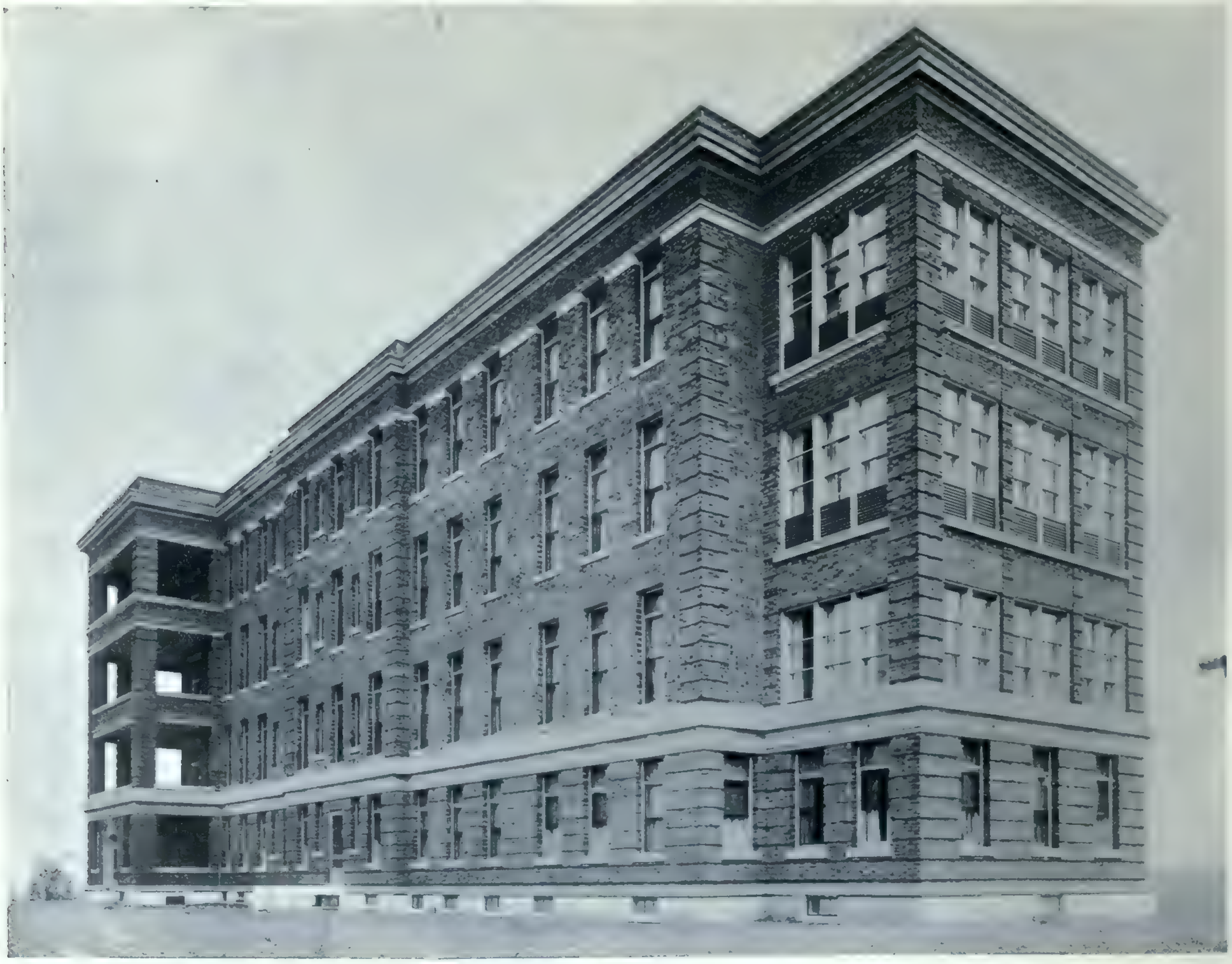
Part of a Large Group of Twenty-two Buildings.

ON May 19th last, His Excellency the Duke of Devonshire formally opened the first unit of the Mount Hamilton Hospital, at Hamilton, Ontario.

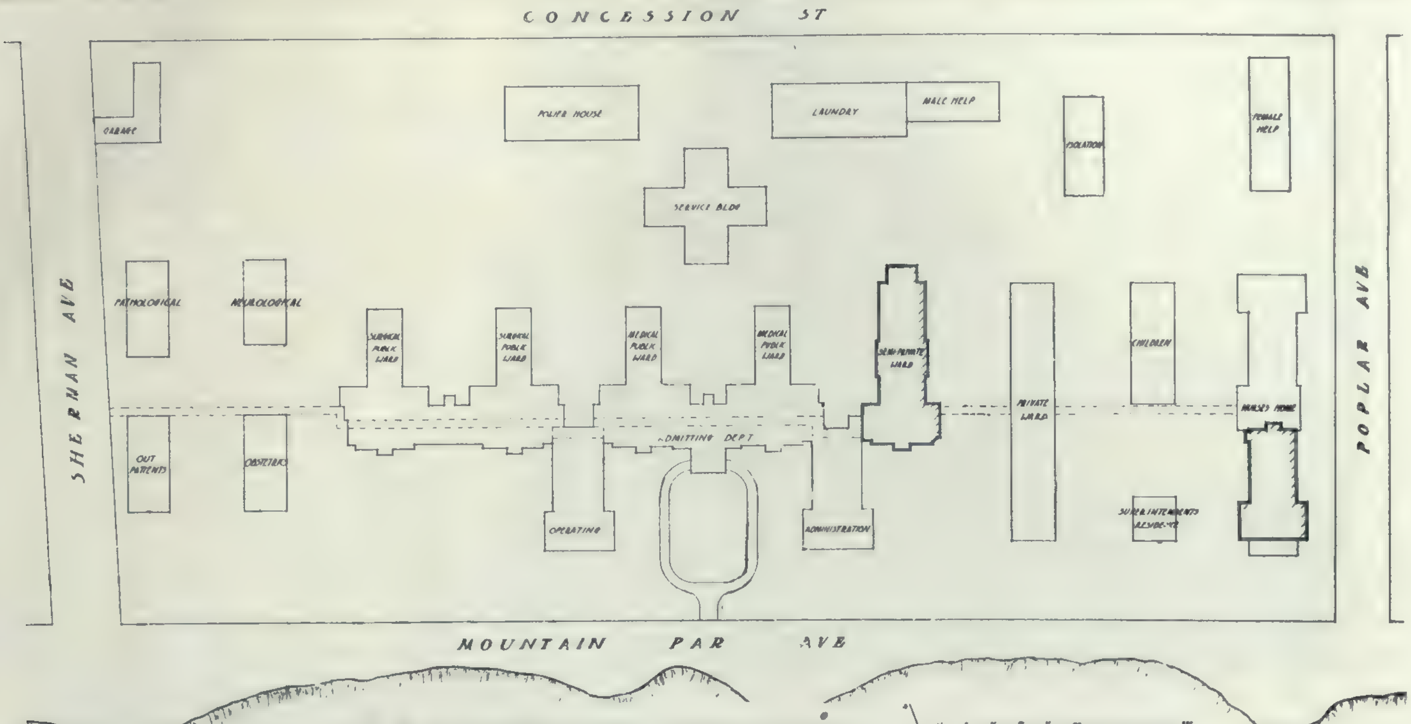
When fully completed, the Mount Hamilton Hospital will be one of the most modern and extensive institutions of its kind on the continent. The plans call for twenty-two buildings, consisting of: Administration building, operating building, two surgical wards, two medical wards, semi-private ward, private ward, children's ward, pathological ward, neurological ward, obstetric ward, out-patients' ward, isolation ward, nurses' home, superintendent's residence, female help building, male help building, service building, laundry, power house and garage. The cost will be about $2,000,000.

The property is on an elevation to the south of and overlooking the City of Hamilton, whence a view is had over the city, the Dundas valley, and Lake Ontario, and has a frontage of 1,140 feet and a depth of 525 feet. It has been very favorably commented on by many authorities as a location for an hospital.

Much investigation among the later United States hospitals, on the part of the architects, Stewart & Witton, Hamilton, in conjunction with Dr. Walter F. Langrill, medical superintendent of the Hamilton City Hospital, was made before the general scheme was planned and presented to the Board of Hospital Governors. The Board approved the plan, as did also Dr. Goldwater, of Mount Sinai Hospital, New York City. Dr. Langrill worked in close co-operation with the architects at all stages of the work. The general scheme, of course, was worked out to take care of requirements for many years to come, the plan being to build as need demanded. On account of the war, the original intention of building the central group, consisting of power house, service, administration and operating buildings, and the public wards, was abandoned, and the buildings illustrated here, the semi-private ward building, and



SEMI-PRIVATE WARD BUILDING, MOUNT HAMILTON HOSPITAL. STEWART & WHITTON, ARCHITECTS.



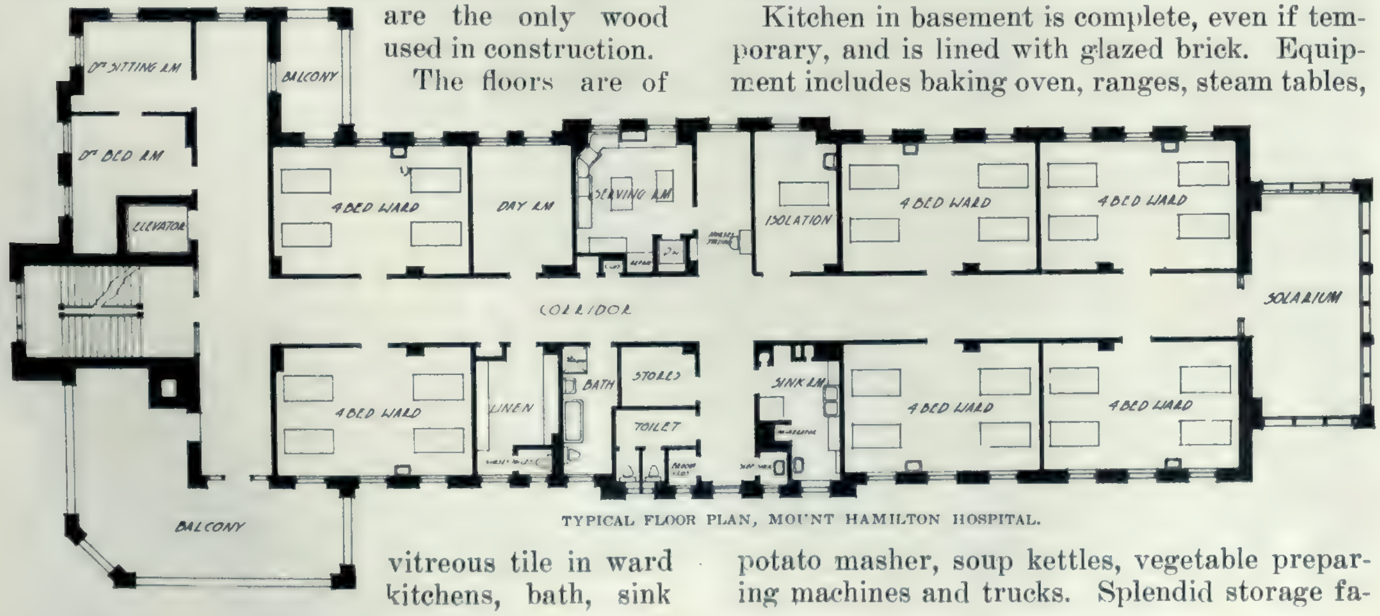
PLAN OF ALL BUILDINGS, MOUNT HAMILTON HOSPITAL.

a portion of the nurses' home, were commenced.

The semi-private ward building will, for the present, be operated as a complete medical case hospital. Temporary provision for the department of administration has been made on the ground floor, with a kitchen and service room in basement.

Each floor contains six wards of four rooms each, isolation ward, day room, doctors' bed and sitting rooms, serving, store, linen, bath, toilet and sink rooms, two balconies and a solarium.

This building is a good example of architectural design of all buildings in the scheme, although the administration and operating buildings will be more elaborate in treatment, they being at the front of the group. The construction is of reinforced concrete faced with buff-colored, rough texture brick, and with sandstone trimmings. The doors and window frames are the only wood used in construction.



TYPICAL FLOOR PLAN, MOUNT HAMILTON HOSPITAL.

The floors are of vitreous tile in ward kitchens, bath, sink and toilet rooms, terrazzo in wards, and cork with an 18-inch terrazzo border in corridors. The sun-room floors are of quarry tile.

Stairs are terrazzo, with cork treads, the junctions of all treads, risers and strings being coved. Windows are finished with marble sills. Door frames are of metal without casings, and all base is of vitreous tile.

The plumbing fixtures, except kitchen sinks and baths, are of wall hanging type, of vitreous ware, and the baths are of porcelain built in. Lighting fixtures in wards are of indirect type, and for other rooms semi-direct.

In sink rooms on all floors there is a modern glass enameled steel laundry chute, a gas incinerator, provision for gas heater for making poultices, and a specimen cabinet, specially ventilated, where patients' specimens are kept until doctors' inspection.

Kitchen in basement is complete, even if temporary, and is lined with glazed brick. Equipment includes baking oven, ranges, steam tables, potato masher, soup kettles, vegetable preparing machines and trucks. Splendid storage fa-

SOLARIUM, MOUNT HAMILTON HOSPITAL.

cilities are provided for food and supplies.

Services are provided for electric power from the lines of both the local electric company and the Hydro. All water is pumped through the building by electricity.

An intercommunicating telephone system and a silent nurses' call system are installed, and in connection with the latter extra receptacles are provided in wall plates for sockets for heating pads and lights. With the nurses' call system, pressure by patient on a push button attached to a flexible cord, illuminates a red bull's eye at head of patient's bed, a red lamp over door of room, and another in head nurse's room, in an annunciator. The annunciator indicates the ward or room from which call comes, and light over door confirms this. The bull's eye indicates the patient making call. Signal cannot be cancelled except at bedside of patient. If there is more than one call from same room, at same time, the cancellation of one does not cancel the others.

OFFICE, MOUNT HAMILTON HOSPITAL.

Lockers' rooms and storage for patients' clothing are provided in basement. Complete dumb-waiter equipment is installed, with opening at all floors.

The heating is of forced circulation hot water type. Ventilation of service rooms and toilets is by exhaust fans. Mechanical refrigeration is provided for all cold rooms and refrigerators. Hot water is supplied from hot water heater in basement, and stand pipes are provided for fire protection with outlets on each floor. An electric vacuum cleaning system is installed in basement, piping being carried to all rooms and corridors.

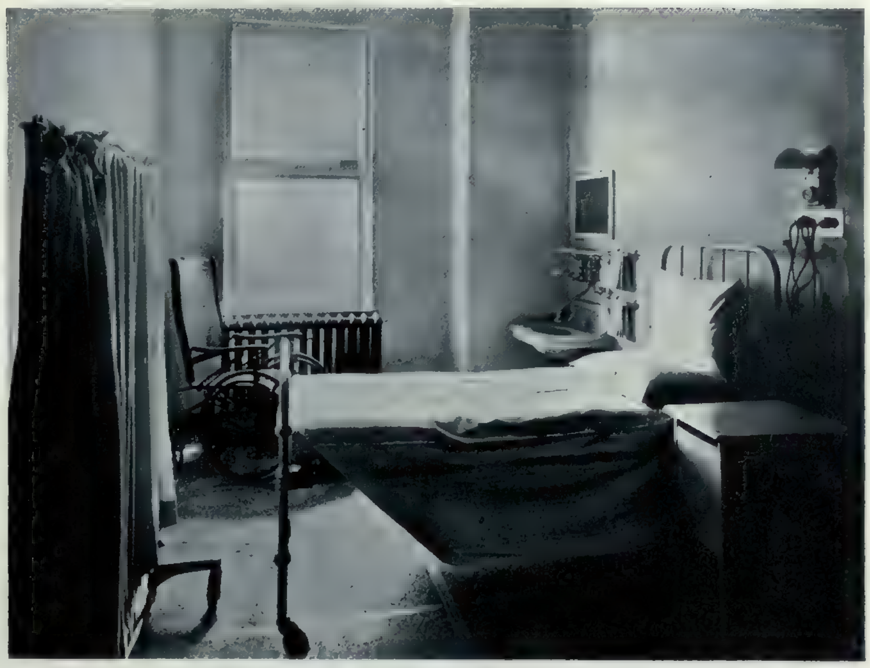
FOUR BED WARD, MOUNT HAMILTON HOSPITAL.

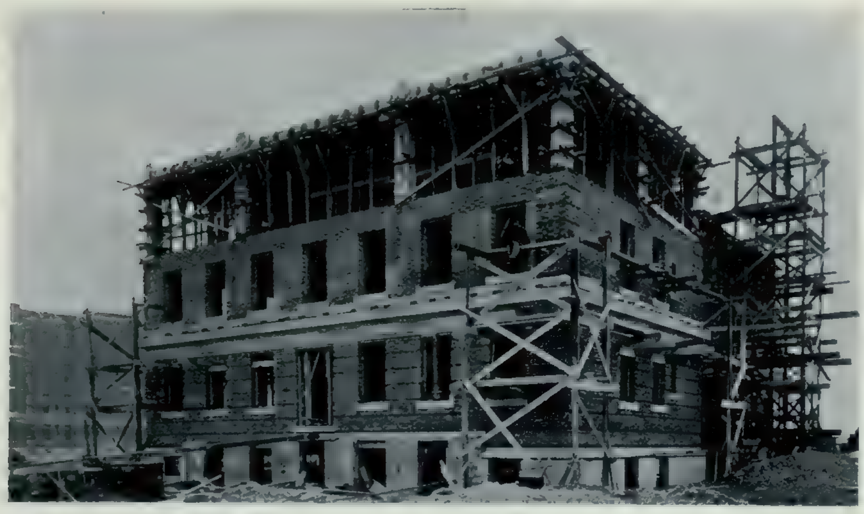
A noticeable feature in connection with the furnishings, which are modern and complete indeed, is the presence of rugs in the wards and sun rooms. Walls are tinted, and will be enameled later. Bedside tables and many other items are of steel.

In the illustration of isolation

ward, can be noticed, against wall, at foot of bed, a rather unusual screen. This screen is simple in construction and operation. It is in five spans. When full open the screen covers the foot of an ordinary hospital bed, by a span four feet six inches wide, and the sides of the bed by spans seven feet six inches long. The height of screen is five feet six inches over all. The sides are adjustable in length, and, when folded, as in illustration, the screen occupies a space four feet six inches long, five feet six inches high, and eighteen inches wide.

Screen is made of tubular steel uprights and cross rods, and mounted on wide malleable iron base fitted with four four-inch, swivel, ball-bearing, rubber-tired castors. The screen cover is made in one piece, of extra heavy and very strong bleached cotton. Loops, tapes, buttons or other fastenings, are not required in any way.


ISOLATION WARD, MOUNT HAMILTON HOSPITAL.

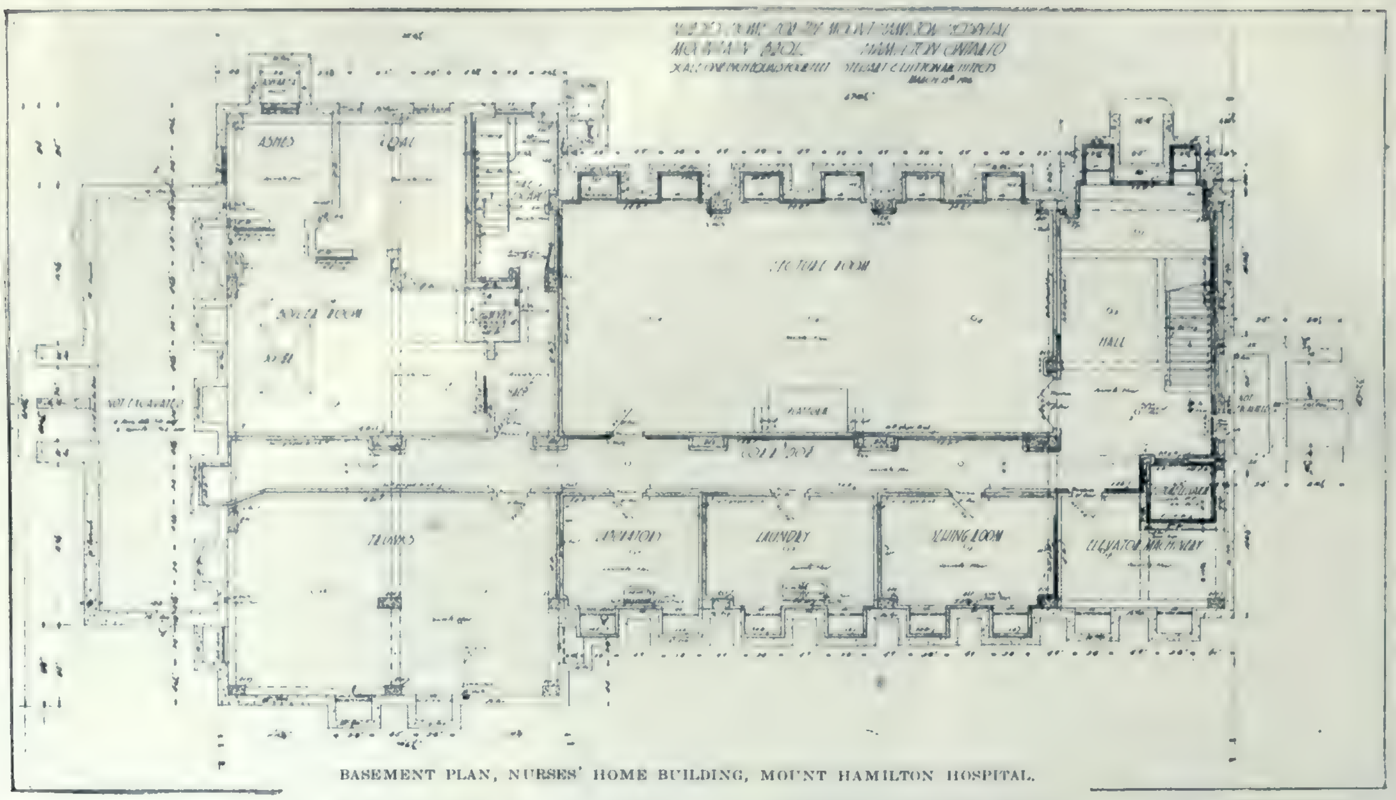

NURSES' HOME BUILDING, MOUNT HAMILTON HOSPITAL.

One of the interesting features of the sun rooms are the shutters on the upper floors. These allow of many variations of ventilation and light, and are the same as those described in connection with the infirmary for the Hamilton Health Association (Mountain Sanatorium) in this issue.

The nurses' home building now under construction is of reinforced concrete, faced with the same brick as the semi-private building, and most other materials are the same. There are four floors and basement. Provision is made in the present building for fifty-one nurses, each of whom is to have a private room containing lavatory and clothes closet. The superintendent of nurses will have a sitting room and bath, besides bedroom on first floor, and there will be a sitting room, lavatory, two bath rooms, shower and dressing room for nurses on each living floor.

The plan for the complete nurses' building unit gives a good idea of the scope of the general scheme. This plan calls for a six-story building, accommodating

DAY ROOM, MOUNT HAMILTON HOSPITAL.


NURSES HOME FOR THE MOUNT HAMILTON HOSPITAL
MOUNTAIN BROW HAMILTON ONTARIO
SCALE ONE INCH EQUALS FOUR FEET STEWART & WITTON ARCHITECTS
MARCH 15th 1916
ASHES
COAL
BOILER ROOM
LECTURE ROOM
HALL
NOT EXCAVATED
CORRIDOR
TRUNKS
LAUNDRY
SEWING ROOM
ELEVATOR MACHINERY

BASEMENT PLAN, NURSES' HOME BUILDING, MOUNT HAMILTON HOSPITAL.

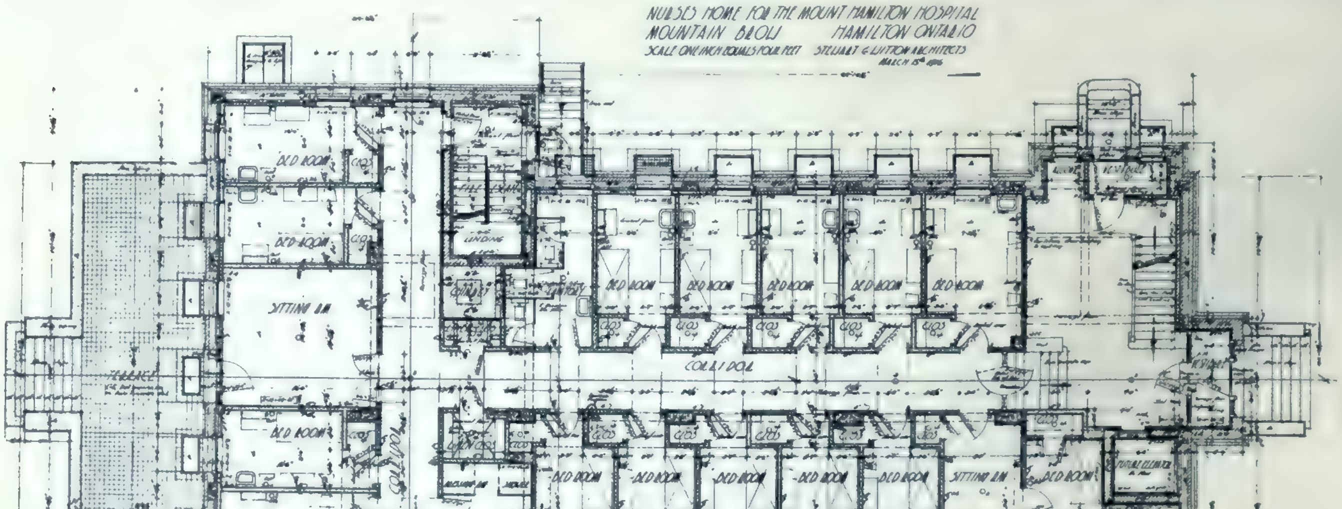
350 nurses, each having a private room. This building will include gymnasium and swimming pool, and will have complete kitchen, store and dining rooms. The portion now being erected can be noted on plan of general scheme.

In the basement are provided lecture room, laboratory, laundry, sewing room and trunk room. All basement rooms have concrete floors. Temporary heating plant is installed, provision being made to couple on to the mains of central heating plant in the future. Separate enclosed fire stairs are provided, as is also a large terrace with red quarry tile floor. Provision is made for elevator in the future.

HOSPITALS AND AESTHETICS

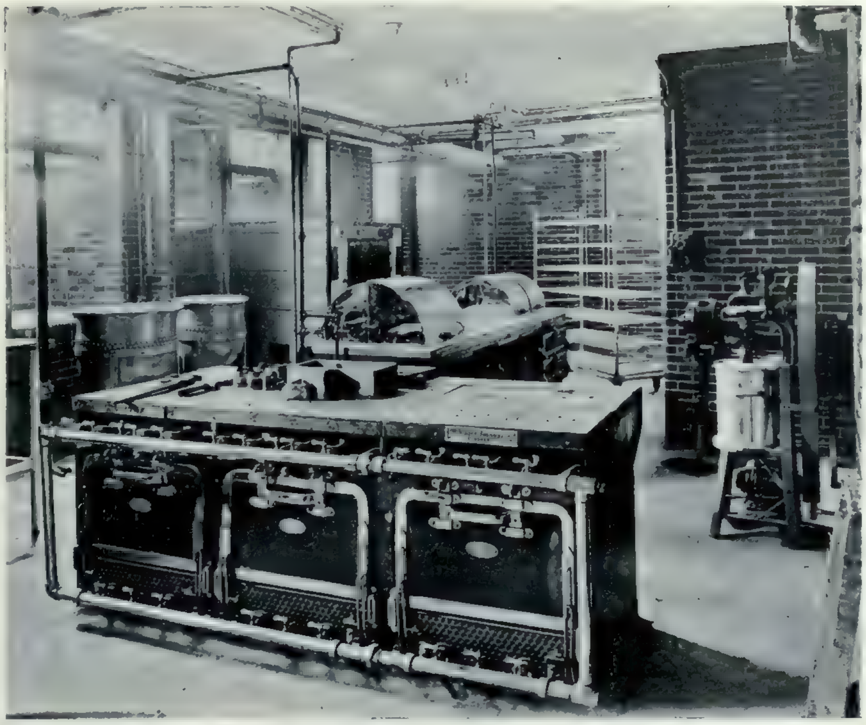
Grosvenor A. Herberry, in Building Management

The generic function of architecture is, of course, the proper housing of the human race, in sickness as well as health, and I venture to say that there is to-day no greater field of prophylaxis against disease. It is fast becoming so recognized in all civilized countries. The point I make is, that if the art and science, the aesthetics and mechanics, of architecture are useful in the prevention of disease, so also may they be of service in its cure, and that this involves more the art than the science of architecture.


NURSES HOME FOR THE MOUNT HAMILTON HOSPITAL
MOUNTAIN BROW HAMILTON ONTARIO
SCALE ONE INCH EQUALS FOUR FEET STEWART & WITTON ARCHITECTS
MARCH 15th 1916
BED ROOM
SITTING RM
TERRACE
CORRIDOR
BATH RM

FIRST FLOOR PLAN, NURSES' HOME BUILDING, MOUNT HAMILTON HOSPITAL.

For the profession may properly be thus defined, theoretically, as of two departments, after the fashion of medicine and surgery. No less, unfortunately, is it largely practised as one to the exclusion of the other, nowhere more regrettably than in the case of the hospital, where too often the science has entered to the exclusion of the art. So it has happened that among all the new hospital conditions that have combined to make the radical advances since the days of Bedlam and the old "Hotel Dieu," one looks usually in vain for the aesthetic element—a consideration of the sense of beauty. With rare exceptions, the only real aesthetic touch in our great hospitals is an accidental one—the trained nurse in her cap and gown. And I venture to say that, considered merely as a piece of decoration, she has done more than any other one thing to counteract the blight of the institutional atmosphere.



KITCHEN, MOUNT HAMILTON HOSPITAL.

The Esculapian temples of healing were shrines of beauty. Should we then consider the modern hospital as nothing more than a huge shelter provided for the surgeon's, doctor's and nurse's work, as an aseptic workshop furnished with power and machinery, the latest tools and the most perfect equipment and scientific aids to research and clinical efficiency, merely a complex of conveniences and apparatus? Or can we consider it not merely a great mechanism, but a silent agent in the art of healing?

BOILER ROOM, MOUNT HAMILTON HOSPITAL.

Is this Utopian? Is there healing virtue in sunny climates, in the scent of pine woods, in the stimulating sight of lofty mountain peaks? And is the value of such things found only in direct physical results? Is environment powerful only in aspects of nature? Does our sense of sight react less powerfully to walls of cheerless, glaring plaster than of sunlit foliage? Must the patient make the effort to shut out the one while he welcomes the other? And is an invalid less sensible to such things than the well man? Is the sense of beauty measured altogether by a man's strength and vitality any more than by the degree of his so-called culture?

Am I wrong in thinking that, after all, the most perfect hospital is the one which most nearly satisfies the requirements of that master of all consultants, Dame Nature, and that diagnosis, operation, treatment, research, are all but a seeking to find the way of least resistance through which Nature shall work? And if this is so can we afford to neglect the least helpful thing, even though we believe others more important? Can we yet say through which door of the bodily senses this healing spirit is most apt to come and go? Above all, should we neglect the sense of sight? Or is it mere poetic license that calls the eye "the window of the soul," thus rating vision, psychically, as our master sense? Is it right that the sense of beauty should receive full communion in God's cathedral of Notre Dame and a block away be cast out like some dreaded heretic from the Hotel Dieu?

That a profession whose great minds hail medicine and surgery as inseparable would wittingly call in the architect to serve as master builder, but exclude him as the artist, I am indeed loath to believe.

"Having torches they passed them on, one to the other." And should it not be to-day—and always—as it was in the days of the torch race? In his address in surgery on the "Realignments in Greater Medicine," Cushing pleads for the wider co-operation of medicine and surgery and their allied sciences which, as he quotes from Huxley, "are independent in proportion as they are imperfect." And so he speaks hopefully of the closer co-partnership into which the men of medicine, surgery and scientific research are now entering. But must we stop there? Is it presumptuous to suggest that in this business of healing the sick in hospitals, the art of architecture be included as a kind of special partner? Are there not times when in the brotherhood of all the arts and sciences one profession should take the torch from another, as did those Greek runners, proud to be its bearer if only for a moment, eager to advance it toward the goal; content if only it be none the dimmer for his carrying, and ready to yield it in turn to some fresh runner in the race of human progress?

SINK ROOM, MOUNT HAMILTON HOSPITAL.

So, while as an architect speaking of things medical I have some fear lest parts of this paper appear to be rather superficial criticism of things beyond the scope of my profession, from a broader point of view I make no apologies. For, to my thinking the universality of art, both in extent and intent, enfranchises the craftsman in every domain of human activity in which he renders service—gives each profession a brevet in the ranks of every other. So I feel that in a large sense, even as it is, I speak among confreres.

MAIN CORRIDOR, MOUNT HAMILTON HOSPITAL.

In such a spirit at all events, encouraged, be it said, by some of those who are to-day the acknowledged torch-bearers of greater medicine, I have thus ventured into its kingdom, asking "safe conduct" for the sake of the art whose passports I carry.

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SOME USEFUL INFORMATION

Solid brick walls with ¼-in. mortar joints require 14 bricks per square foot of wall 9 in. thick, 21 for 13-in. walls, and 28 for 18-in. walls. To lay 1,000 brick with 3-16-in. joints requires 8 cu. ft. of mortar, ¼-in. joints 10 cu. ft., 5-16-in. joints 12 cu. ft., ⅜-in. joints 16 cu. ft. To lay 1,000 brick in 1:3½ cement mortar ⅜-in. thick requires 1¼ bbl. cement and five bags or 18 cu. ft. of sand.

FOOD STORAGE WALL FIXTURES IN MOUNT HAMILTON HOSPITAL.

Infirmary of Hamilton Health Association

Modern Building on Mountain for Treatment of Pulmonary Tuberculosis.

IN 1913 the Hamilton Health Association, operating the Mountain Sanatorium, found it necessary to erect a building to give additional accommodation for patients with advanced cases of pulmonary tuberculosis.

On the selection of the architects, Stewart & Witton, a member of the firm in whose charge the work was to be, in company with Dr. J. H. Holbrook, medical superintendent, visited a great many of the sanataria in the United States, studying the design and equipment, with a view to making the building in hand modern in every way.

The property of the Association is located to the west of and on the brow of an elevation overlooking the Dundas valley, with a frontage of 1,200 feet and a depth of 2,900 feet. The brow frontage is somewhat spoiled for building purposes by being deeply cut into by a ravine which leaves approximately equal frontage on the brow on each side.

Though the main group of buildings were at the southerly part of the property, it was decided to build this infirmary at the brow and make it complete in all departments, except the laundry.

The proper designation for this building is "The Infirmary for the Hamilton Health Association," but for brevity's sake it will here be called the "Hamilton Mountain Sanatorium," a name which is commonly applied to it and other buildings of the association.

The building is of fireproof character, of reinforced concrete and hollow tile, faced with buff brick, and designed for a future third story, and, from the accompanying plans, will be seen the extent of provision for the open air treatment of patients.

The distinctive feature of the building is the arrangement of the wards, inner rooms heated in winter and separated by folding doors from the balconies, are provided for use at meal times and for bathing and dressing.

Each ward, except isolation wards, has its balcony, the beds, mounted on large castors, being moved with ease from one to the other. There are twenty-two beds on the ground floor, and twenty-eight on the first floor. Besides these, on the ground floor are two isolation wards, and on the first floor five.

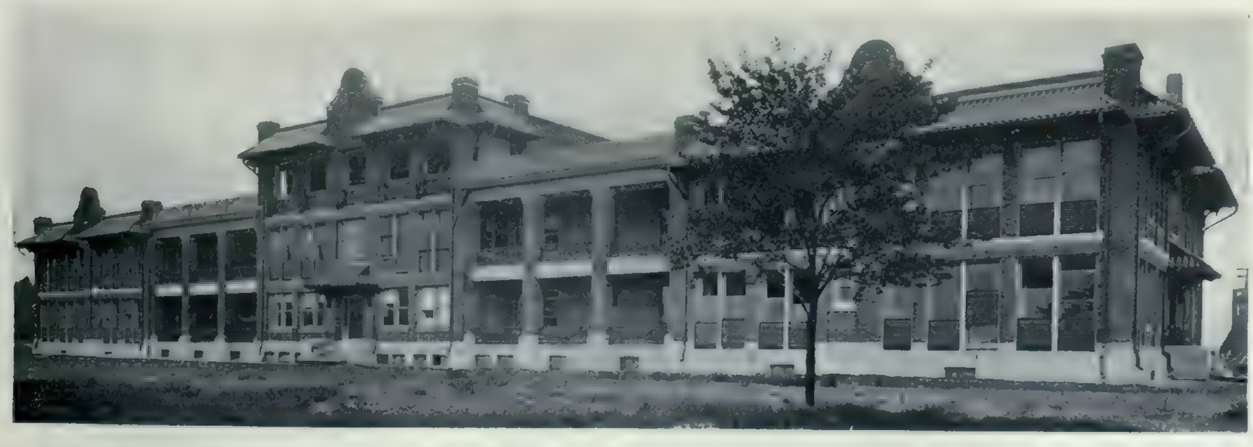
The balconies are provided with double-hung sash, sliding shutters and wire screens which can be kept below the sill level when conditions permit. The shutters, when up, permit free access of air, and keep out the sun, and, to some extent, rain and snow.

Entering through the vestibule to the public hall, to the right are nurses' room, examining room, waiting room and pharmacy, and to the left offices, private office of medical superintendent and laboratory. This floor contains the main kitchen, store room well equipped with bins and wall cases, nurses' and helps' dining rooms. On the other floor are diet kitchen, serving room and doctors' bed and sitting rooms and sleeping porch.

Floors are of terrazzo and concrete treated with concrete hardener. All door frames are of steel. A locker room with steel lockers is provided. All bedside tables are of steel. A silent nurses' call system, similar to that on the Mount Hamilton Hospital, is installed, as is also dumb waiter equipment.

The building is provided with mechanical refrigeration, electric light and power, and is heated by a forced circulation hot water system.

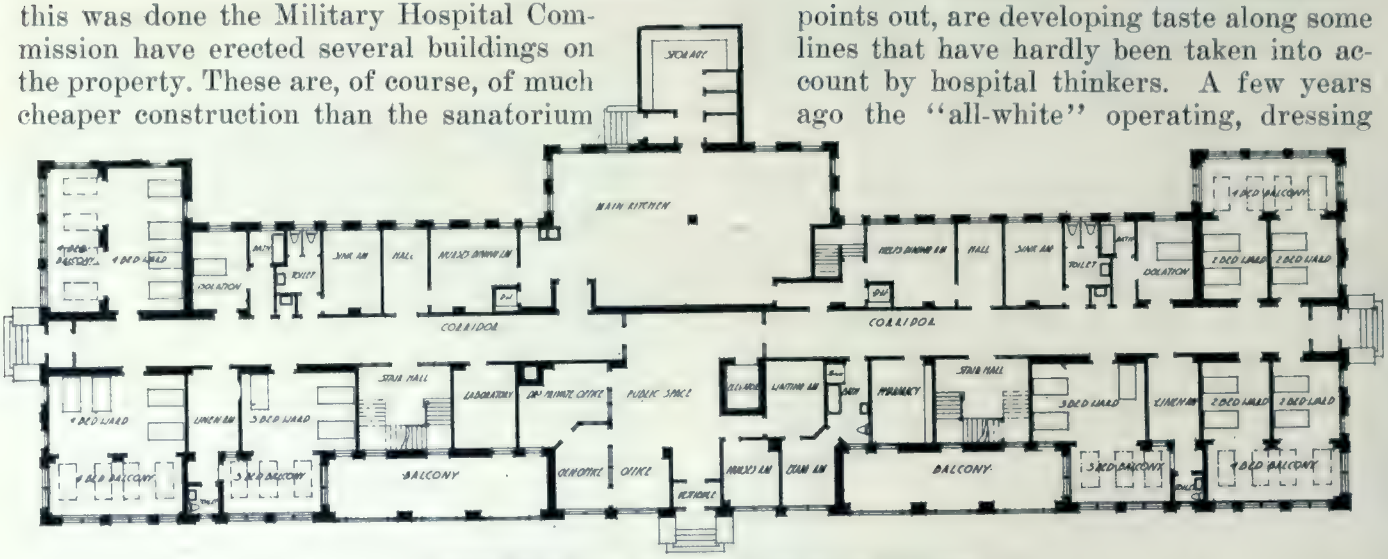
At the request of the Government, this building was temporarily given over for the treatment of returned tubercular soldiers. Since



MOUNTAIN SANATORIUM, HAMILTON. STEWART & WITTON, ARCHITECTS.

BALCONY, MOUNTAIN SANATORIUM, HAMILTON.

this was done the Military Hospital Commission have erected several buildings on the property. These are, of course, of much cheaper construction than the sanatorium proper. Two views, one of a dining room, and one of a ward of the Commission buildings, are given.



GROUND FLOOR PLAN, MOUNTAIN SANATORIUM, HAMILTON.

KITCHEN, MOUNTAIN SANATORIUM, HAMILTON.

TASTE AND REFINEMENT IN HOSPITALS

In recognition of the powerful influence of environment, hospital administrators are nowadays thinking about making their institutions attractive to all the senses. They invoke beauty of architecture and decoration to please the eye; harmony of sound, music, and quiet, in which harsh noises are prohibited, to please the ear; flowers and sweet scents (in place of the old-time hospital smells, iodoform and carbolic acid) to please the sense of smell; soft fabrics, blankets, and linens, and smooth, clean furniture, to please the sense of touch; and appetizing foods to please the sense of taste.

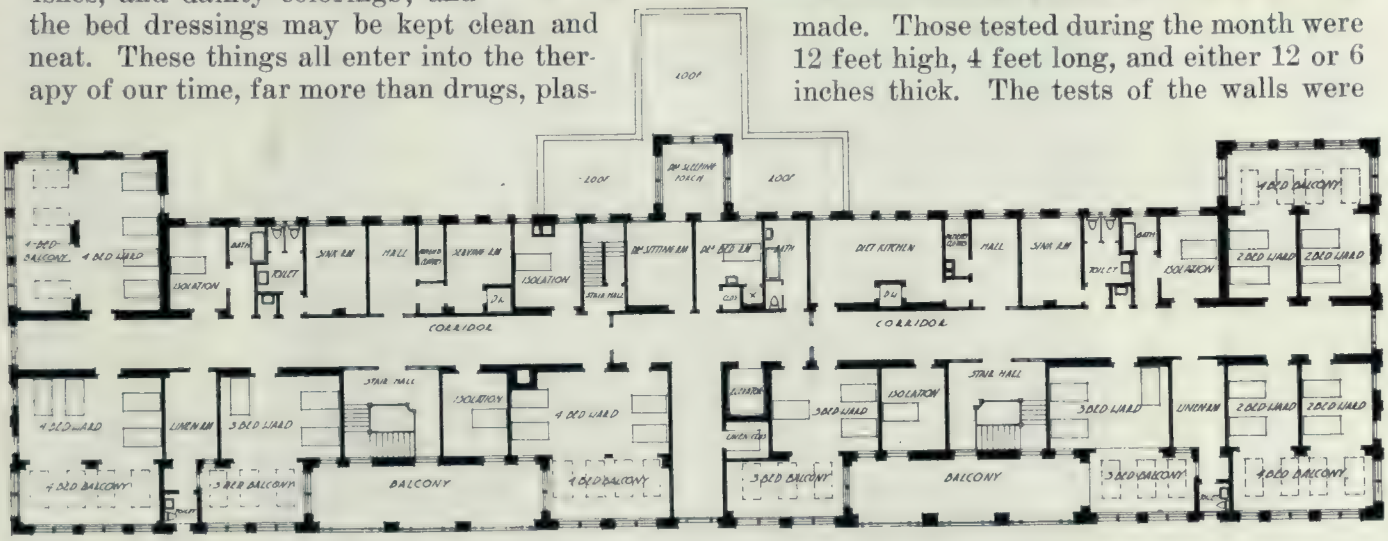
But we, the "Modern Hospital" points out, are developing taste along some lines that have hardly been taken into account by hospital thinkers. A few years ago the "all-white" operating, dressing and service rooms were regarded as the very last word on asepsis; and we have in mind a few hospitals in which the "all-white" fad was permitted to rule even in the private rooms, and white metal beds, white enameled dressers and tables, and white linen covers and shades were to be found.

It seems that we have well passed this stage of attractiveness now, and superintendents and trustees of taste and culture are planning for "pretty things" in furniture and accessories. That is why the idea of having well-to-do people of refinement furnish individual rooms has taken so strong a hold on the trained hospital mind.

It is a joy to go into a hospital and find evidences of good taste and refinement on every hand, the private rooms provided with attractive carpets or rugs, the windows tastefully draped and shaded, the furniture in pretty styles and of good material, well treated. And if the rooms are all different in their furnishings, each one striving, as it were, to be more inviting than the others, it gives one the feeling that the creature comforts and the sensibilities of patients, as well as their ailments, are given care and thought.

WARD, MILITARY HOSPITAL, HAMILTON.

There is no reason why the wards may not also share in these beneficences. Pretty rugs, large and small, can be disinfected and kept clean; window shades and drapings may be artistic, soft and pleasing; the beds may be in attractive patterns, pleasing polishes, and dainty colorings; and the bed dressings may be kept clean and neat. These things all enter into the therapy of our time, far more than drugs, plasters and poultices. May more hospital superintendents find the money to add their share to the new era of good taste and refinement in hospitals!



SECOND FLOOR PLAN, MOUNTAIN SANATORIUM, HAMILTON.

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TESTS OF TILE WALLS

During the month of April the first of several tests of tile walls were made by the United States Bureau of Standards. While previously various commercial tests of the load-carrying capacity of tile walls had been made, in the present case the work is part of a large investigation which is being made at the suggestion of the tile manufacturers and of the committee on hollow tile of the American Society for Testing Materials.

About fifty walls of various heights and thicknesses will be made. Those tested during the month were 12 feet high, 4 feet long, and either 12 or 6 inches thick. The tests of the walls were satisfactory in every case, high loads being obtained, and material showed good deportment.

DINING ROOM, MILITARY HOSPITAL, HAMILTON.

New Surgical Pavilion of St. Joseph's Hospital

Addition to Hamilton Institution Provides for Future Extensions.

LACK of accommodation and the need of the more effective separation of medical and surgical cases was the prevailing motive for the building of a new surgical wing at the St. Joseph's Hospital, erected at Hamilton, Ont. The location of this wing to the west of the present building had in view the future development of this institution so that the ward wings would eventually run north and south with the administration building between them, changing the present entrance from the west to the south. The power house and laundry are at the extreme west of the property.

The immediate problem was to provide a building for about sixty patients (both public and private), with the necessary ward accessories and operating suite. In addition to these there have been provided all the culinary department, dining rooms, nurses' instruction rooms, X-Ray department and laboratories for the entire hospital.

ST. JOSEPH'S HOSPITAL, HAMILTON. STEVENS & LEE, ARCHITECTS, TORONTO.

As the sum at the disposal of the Hospital authorities was limited, the building materials and type of construction had to be carefully considered to keep the cost down to the necessary minimum. The cost of this wing has worked out at less than $1,500 per bed.

The exterior is of grey brick with limestone trimmings to harmonize with the existing building. There are three stories and basement, with a corridor in the basement and on the ground floor connecting with the existing building. The pan system of reinforced concrete was adopted to obviate the necessity of suspended ceilings, which have been used only in certain rooms to conceal plumbing pipes. The floor slabs rest on concrete columns and girders and the exterior brick walls.

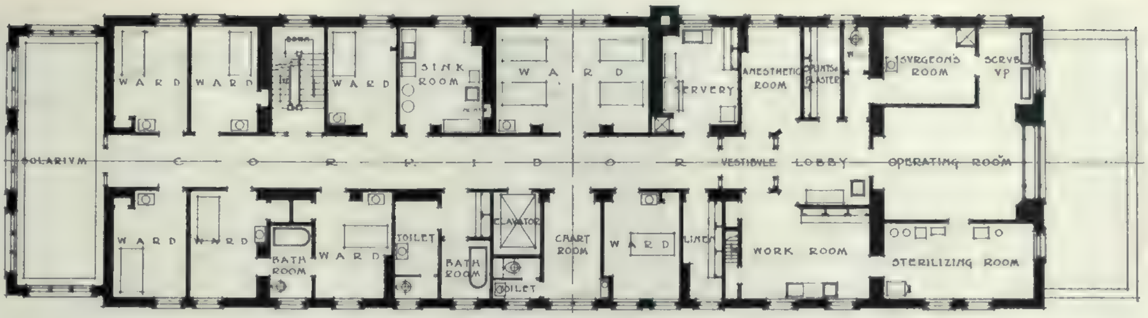
The partitions are of hollow tile with wall furring of the same material. The finish in general is of hard plaster painted, this coming flush with a terrazzo coved base, which extends out into the rooms as a border to and flush with the Jaspe linoleum finish of the floors. The door and window frames are flush with the plaster and the joint is covered with a small metal strip giving the least possible lodgement for dust. All doors are flush panel, sanitary type, veneered in birch.

All toilet rooms, serveries and sink rooms have a full terrazzo floor, and the stall partitions are of Vermont marble. The windows of the patients' rooms are provided with a ventilating apron, to prevent the draught coming upon the patient.

The service entrance is through an area into the receiving room, where all goods are checked and weighed. The store rooms and cold storage rooms are adjacent to this room and easily accessible from the kitchen. In the latter are provided gas range and charcoal broiler, vegetable steamer, stock kettle, cereal cooker and water urn. In the scullery is apparatus for the preparation of vegetables and ice cream making, run by an electric motor. The food is served to the different floors through dumb waiters opening into the ward serveries and thence on trays by the nurses.

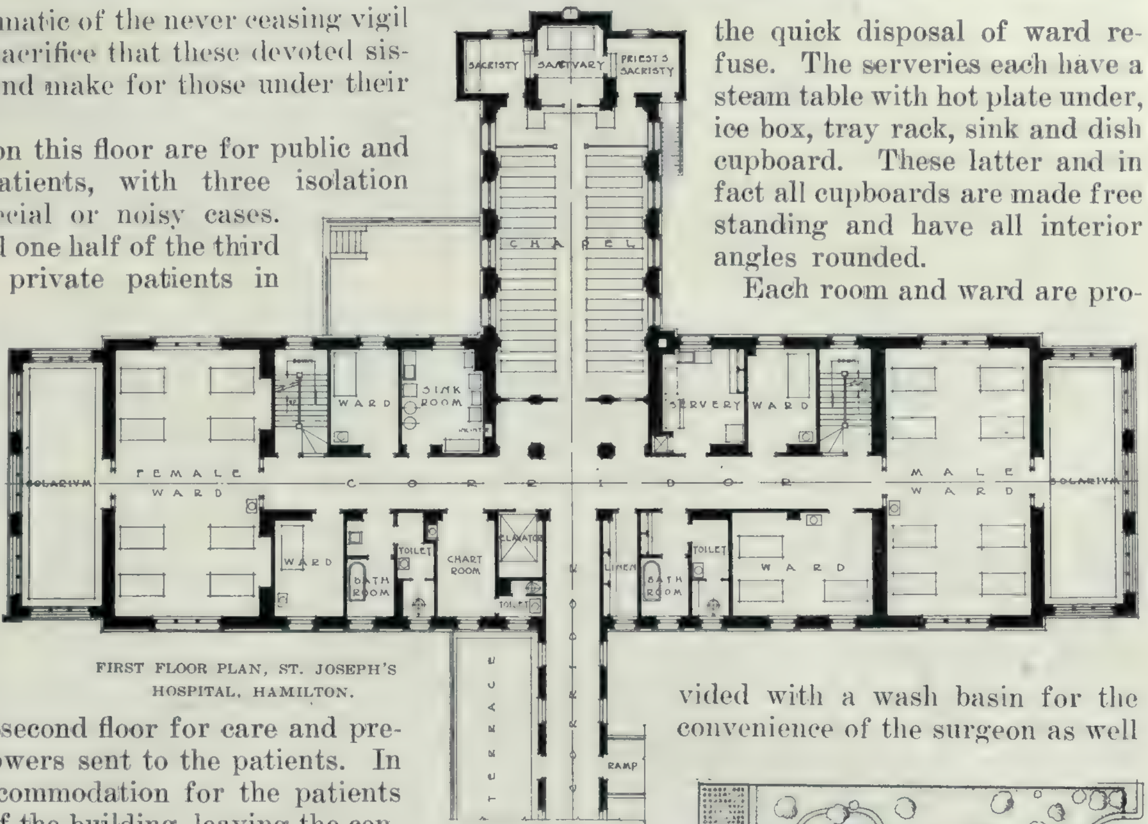
In close proximity to the main kitchen are located the nurses', sisters', servants' and special dining rooms. The latter is for the priests and any visiting friends. There is a separate servery for these with carving and steam table for keeping the food hot. The remainder of the basement is taken up with the X-Ray department, laboratory and the different instruction rooms for the training of the nurses, which includes a kitchen for diatetic work.

Coming to the ground floor, on the main axis is located the chapel, which is one story in height. There is a flat tile roof over this, giving provision for the open air treatment of cases



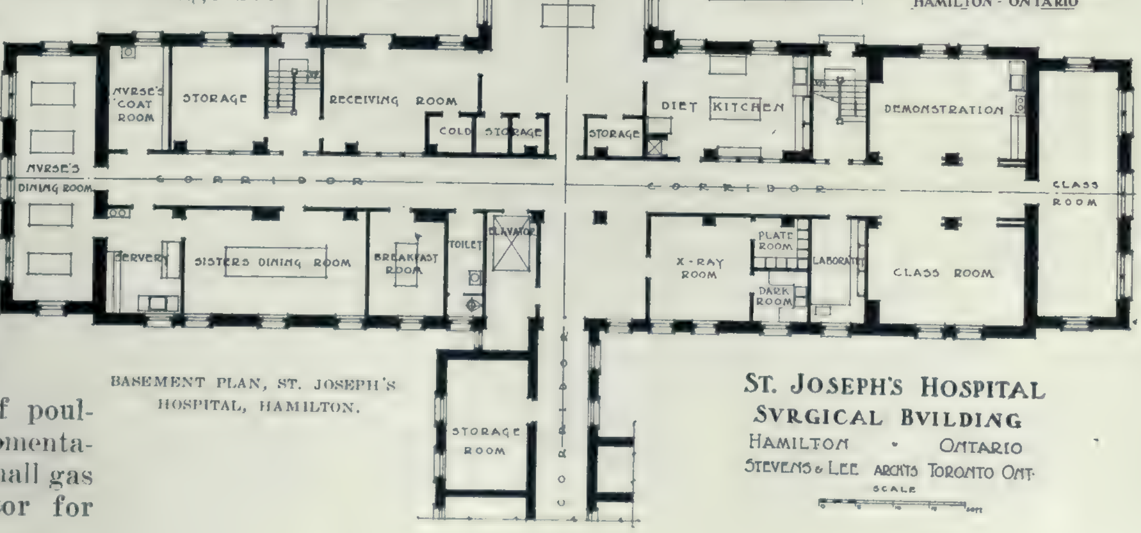
that require it. In the sanctuary of the chapel a ceiling fixture contains an oil lamp never allowed to be extinguished, which is emblematic of the never ceasing vigil and constant sacrifice that these devoted sisters exercise and make for those under their charge.

The wards on this floor are for public and semi-public patients, with three isolation rooms for special or noisy cases. The second and one half of the third floor are for private patients in single rooms and semi-public patients in wards of four each, there being three suites of bedrooms, which may be let together or separately. There is a room on the second floor for care and preservation of flowers sent to the patients. In general the accommodation for the patients is at the ends of the building, leaving the centre for the rooms assigned to the work of the nurses, which is of necessity more or less noisy.



FIRST FLOOR PLAN, ST. JOSEPH'S HOSPITAL, HAMILTON.

At each end of the building on all floors are sun rooms with quarry tile floors. These are heated and have sash that fold back to the jambs with special hardware, permitting the full daylight opening of each window, so that the rooms may be used to the best advantage both in summer and winter.

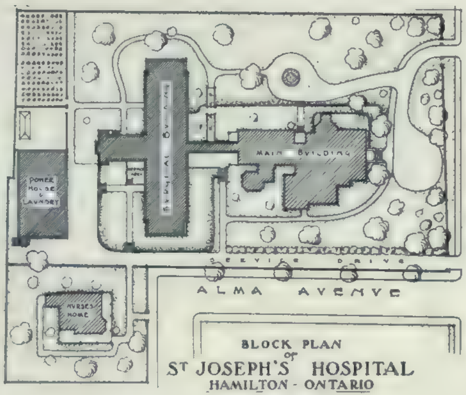


BASEMENT PLAN, ST. JOSEPH'S HOSPITAL, HAMILTON.

ST. JOSEPH'S HOSPITAL
SVRGICAL BVILDING
HAMILTON - ONTARIO
STEVENS & LEE ARCHTS TORONTO ONT.

The sink rooms are equipped with sink for general work, bed pan sink and rack, utensil sterilizer, gas plate for the making of poultices and fomentations, and a small gas wall incinerator for the quick disposal of ward refuse. The serveries each have a steam table with hot plate under, ice box, tray rack, sink and dish cupboard. These latter and in fact all cupboards are made free standing and have all interior angles rounded.

Each room and ward are provided with a wash basin for the convenience of the surgeon as well



BLOCK PLAN OF ST JOSEPH'S HOSPITAL
HAMILTON - ONTARIO

CHAPEL IN ST. JOSEPH'S HOSPITAL, HAMILTON.

as the patient. Back of these basins the wall is lined with white tile flush with the wall, and in this tile are set vitreous mirror frames and soap dishes flush with the tile.

There is a nurse call at the head of each bed, which registers by lights in the corridor over the door of the room or ward and in the floor chart room, where is located the head nurse's desk. In wards there is a pilot light showing which patient in that ward made the call. There is a locking device on the call button, so that the call may only be cancelled by the nurse answering it, at the bed, with a key which operates the device. This system is operated by duplicate sets of storage batteries, charged from a motor generator set. A telephone jack is installed in the private rooms for the use of the patient, but the instrument itself is portable.

SOLARIUM IN ST. JOSEPH'S HOSPITAL, HAMILTON.

The operating department, located on the top floor at the north end of the building, is entered by two set of doors with vestibule between. The latter gives directly into the anaesthetic room, so that the patient is etherized before being brought into the working part of the suite. The lobby, lighted from above, opens into all the different rooms of the department. On one side of the operating room are the surgeons' dressing room, toilet and scrub-up, there being no door to touch in entering the operating room from the scrub-up. On the other side are the nurses' work room and the sterilizing room. The equipment of the latter consists of dressings, water, utensil, and instrument and glove sterilizers set on one combination pipe frame. All the plumbing fixtures in this department, as well as the rest of the building are special, with elbow valves and removable strainers for cleaning the pipes and traps. There is a sink for the orderly in the lobby and a flushing floor drain in the operating room.

The heating of the operating room, on a separate steam riser is by direct radiation placed between two sheets of glass in metal frames, forming a heated air chamber between the outside temperature and that of the room itself, fresh air being introduced under the sill.

KITCHEN IN ST. JOSEPH'S HOSPITAL, HAMILTON.

LARGE WARD IN ST. JOSEPH'S HOSPITAL, HAMILTON.

In order to provide efficiently for the diverse steam services in an institution of this nature, a central power house has been built of a sufficient size to take care of future extension. For present needs two high pressure boilers of 150 horse power each have been installed. The high pressure steam, transformed by pressure reducing valves, is used for the laundry, cooking, sterilizing, etc., and to supplement the low pressure steam, which is used for heating the new wing. The boilers are fed by horizontal feed pumps, which are in duplicate.

The heating in general is by direct radiation through hospital radiators set three inches from the wall and supported off the floor on cast iron brackets. Exhaust ventilation is provided through galvanized iron ducts to the penthouses on the roof. There are four separate systems as follows: The wards; the toilets and sink rooms; the kitchen and serveries; and the operating suite. Each is operated by a fan and the air is by-passed through a set of steam coils so that it will operate when the fan is shut down.

Stand pipes are installed for fire protection with two outlets on each floor connected with automatic hose reels. The vacuum cleaning apparatus is in the basement and is piped to each floor with electric remote control back to the operating motor.

OPERATING AND SURGEONS' WASH ROOMS IN ST. JOSEPH'S HOSPITAL, HAMILTON.

PRIVATE WARD IN ST. JOSEPH'S HOSPITAL, HAMILTON.

Hot water is heated for all buildings by means of generators connected to storage tanks with thermostatic control. The heating of the old building, which was formerly done by three hot water boilers, is now taken care of by a generator and an electrically driven circulating pump with a steam auxiliary in reserve. At present the hospital will buy its current for light and motor services, but when it has expanded in the future, it is proposed to install electric generators to manufacture its own current and be independent of transmission troubles.

MAIN BUILDING, NEW WINGS AND COTTAGES, TORONTO FREE HOSPITAL FOR CONSUMPTIVES, WESTON, ONTARIO.

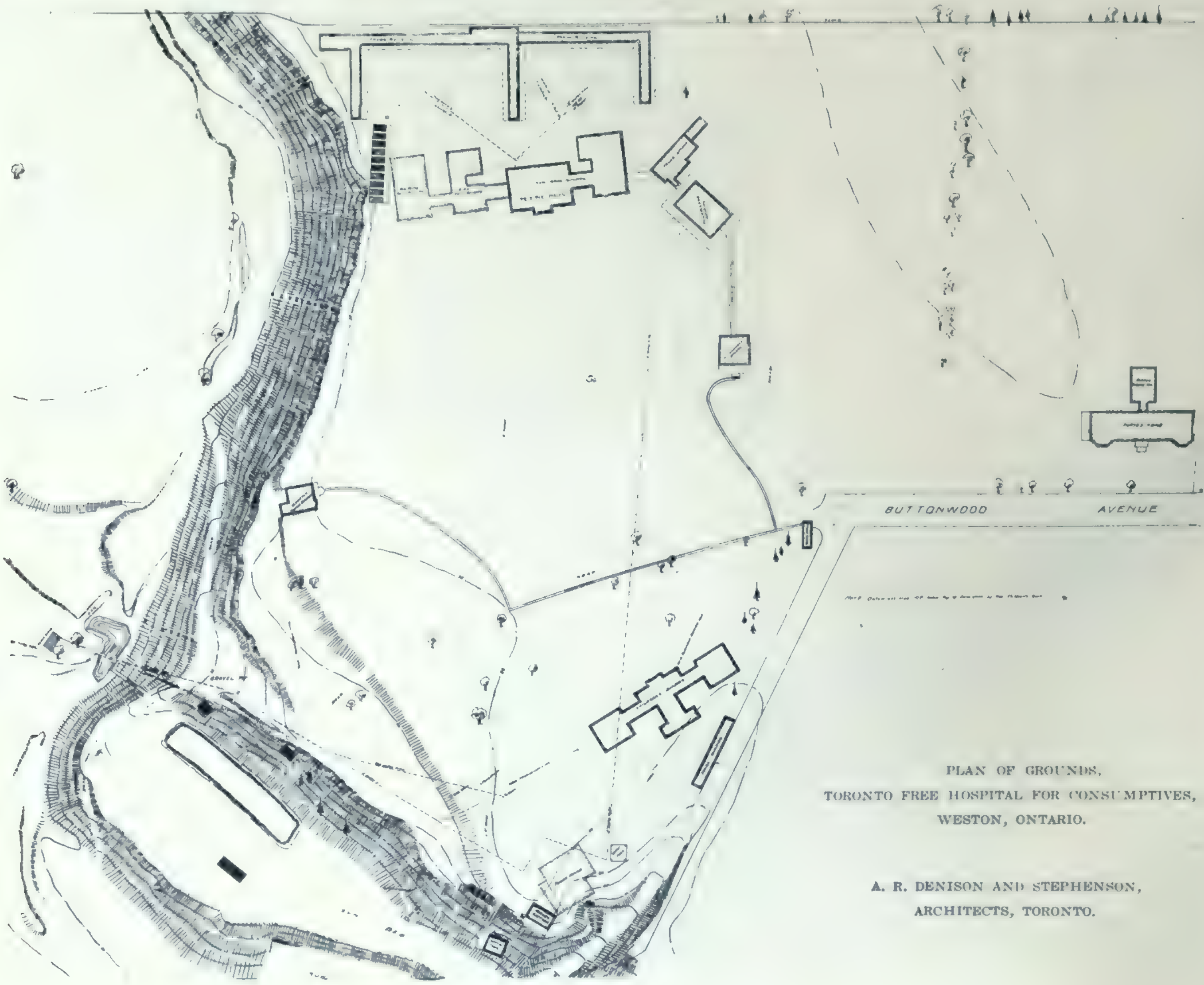
Toronto Free Hospital For Consumptives

Group of Fireproof Buildings Being Erected to Replace Wooden Structures Destroyed by Fire.

ABOUT fifty acres of fine land of natural beauty comprise the site on which the hospital buildings stand, on the east bank of the Humber River, and on the Toronto and Weston Electric Railway. The buildings erected represent a cost of about $250,000, and, including the new wing, have a capacity of four hundred patients.

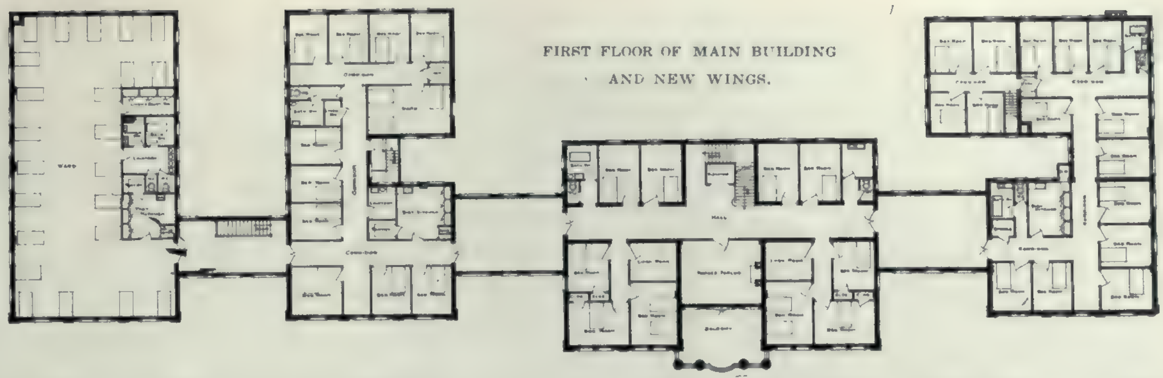
In 1909 the main portion of the then existing frame buildings was destroyed by fire, and the Hospital Association decided to replace the destroyed buildings with more substantial structures. The new buildings are well planned and of uniform design.

The buildings, with the exception of the nurses' home, are grouped around three sides of an extensive open court, so that all command a fine outlook across the Humber valley. The court is approximately two hundred yards wide, and is sodded and laid out in flower beds and concrete walks, allowing ample space for recreation for convalescing patients.



PLAN OF GROUNDS,
TORONTO FREE HOSPITAL FOR CONSUMPTIVES,
WESTON, ONTARIO.

A. R. DENISON AND STEPHENSON,
ARCHITECTS, TORONTO.



FIRST FLOOR OF MAIN BUILDING AND NEW WINGS.

The buildings erected during recent years are of fireproof construction, the outer walls being of solid brick, foundation walls of concrete, and floors of slab concrete supported on steel beams encased with concrete. The inside partitions are mostly of gypsum slab construction, this being chosen on account of its lightness in weight and fireproof qualities.

The exteriors of the buildings are faced with dark purple stock brick, having a white putty mortar joint, the main facades being relieved with artificial stone. The cornices are of metal painted and sanded to match the stonework. The roofs are of concrete similar to floors, on the top of which is a built-up wooden roof covered with felt and gravel. This idea is carried out in all the new buildings, so that when an additional story is added the present concrete roof becomes the floor of the new story.

WARD IN NEW WING AT WESTON SANATORIUM.

The concrete floors are in most cases covered with Scotch battleship linoleum. The new wing to main building, just completed, has terrazzo floor, which was found to be more sanitary, and so far has given perfect satisfaction. The terrazzo is carried up the walls six inches in height in the form of a cove base. The stairs throughout are of concrete with birch newels and handrails. The walls and partitions throughout are plastered, and decorated with enamel of various subdued tints to harmonize with fittings of rooms.

A noticeable feature throughout is the omission of all angles, projections, etc., wherever practicable. The plaster is rounded at all internal and external angles of walls, partitions, ceilings and beams. The trim is also omitted wherever possible, the plaster at window and door jambs being bull-nosed and returned into frames, with small birch quarter-round moulding at intersections. There are no wooden baseboards, a large quarter round birch moulding being substituted.

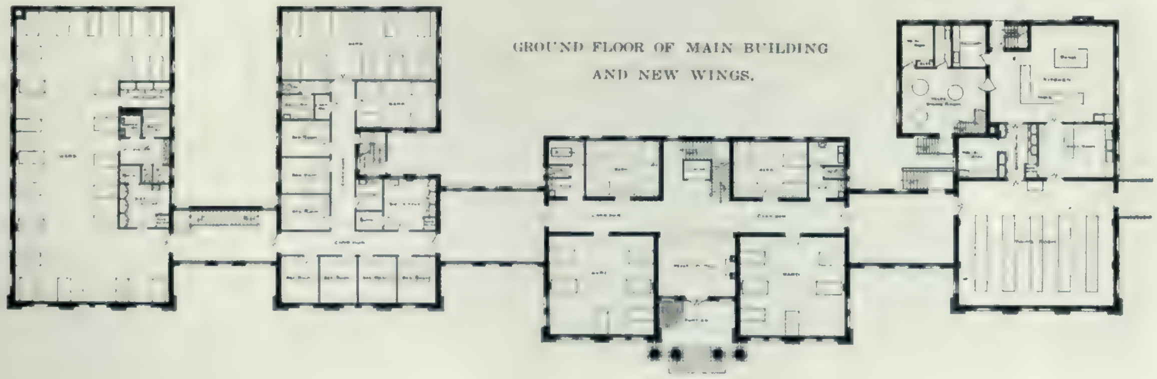
The buildings throughout are well lighted by electricity on the semi-indirect system. Electric plugs are provided for attachment of vacuum cleaners.

The wards and private rooms are all equipped with a silent nurse call system, each bed being provided with bell push which signals direct to an indicator board at nurses' desk.

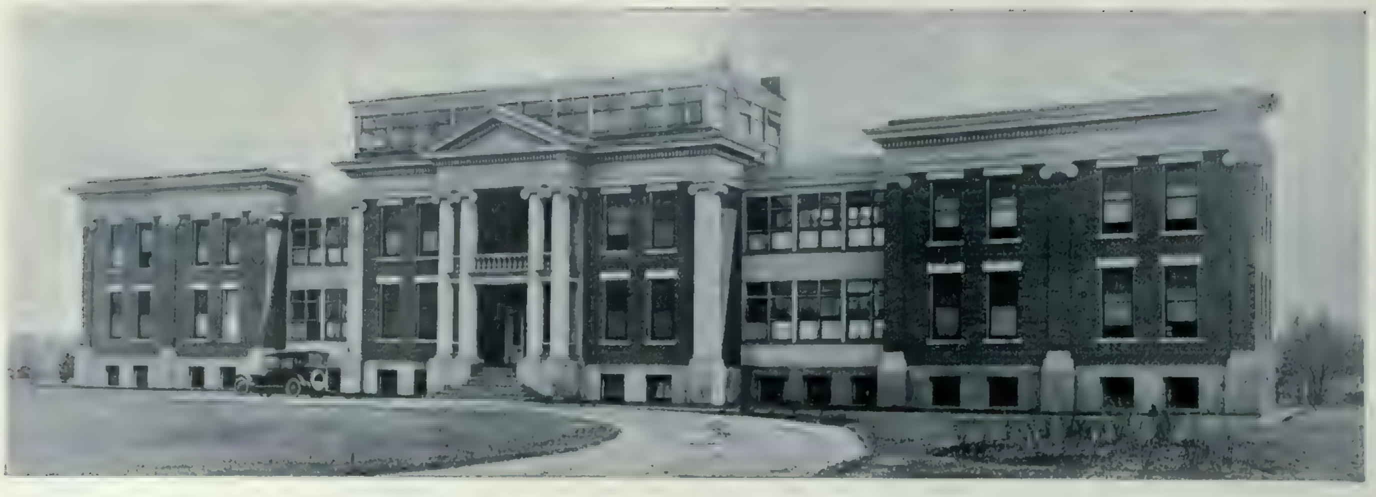
Ample bathroom and lavatory accommodation is provided on each floor of the buildings.

The main building, which was the first building erected under the new scheme, consisted of a centre building with a wing building on either side, connected by spacious well lighted corridors. This building is located on the north of the property and faces south. An additional wing has just been completed and put in operation.

The basements of the centre building and wings of same building are divided into bedrooms, the portion below the corridor being util-



GROUND FLOOR OF MAIN BUILDING AND NEW WINGS.



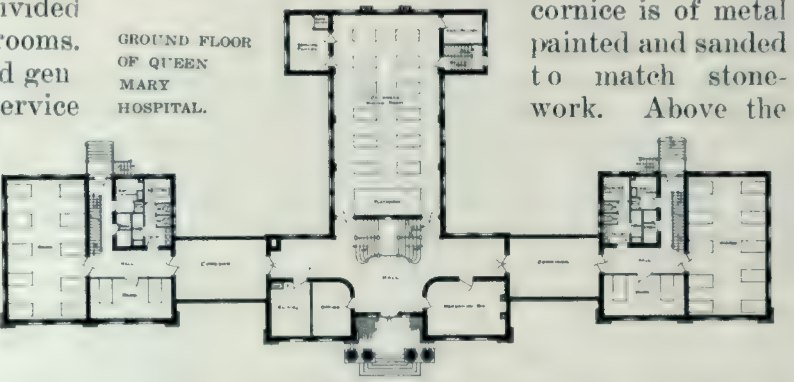
QUEEN MARY HOSPITAL, CHILDREN'S BUILDING, WESTON SANATORIUM.

ized as a large rest room. The boiler room, fuel room, etc., are located in the basement of the east wing. The basements of these buildings stand well up out of the ground, have high ceilings, and are well lighted and ventilated.

The ground floor of centre building is divided into wards, and floor above into single rooms. On the ground floor of east wing is located general dining room, with large kitchen, service pantry, etc. On this floor is also a smaller dining room for the kitchen help. The floor above is divided into single bedrooms, a portion being separated and used exclusively by kitchen attendants. The first and second floors of west wing are each divided into bedrooms and small wards, with bath rooms, lavatories and diet kitchens. The first and second floors of the new wing are used as large twenty-three-bed wards, with bath room and lavatory accommodation, chart room and diet kitchens.

The centre portion of main building has an imposing entrance, with concrete steps leading up to portico with red quarry tiled floor and large circular stone Ionic columns two stories in height. The corners of centre building and wings are defined by stone Ionic pilasters. The cornice is of metal painted and sanded to match stonework. Above the columns of main entrance is an ornamented pediment. The heads and sills of all windows are of artificial stone.

GROUND FLOOR OF QUEEN MARY HOSPITAL.

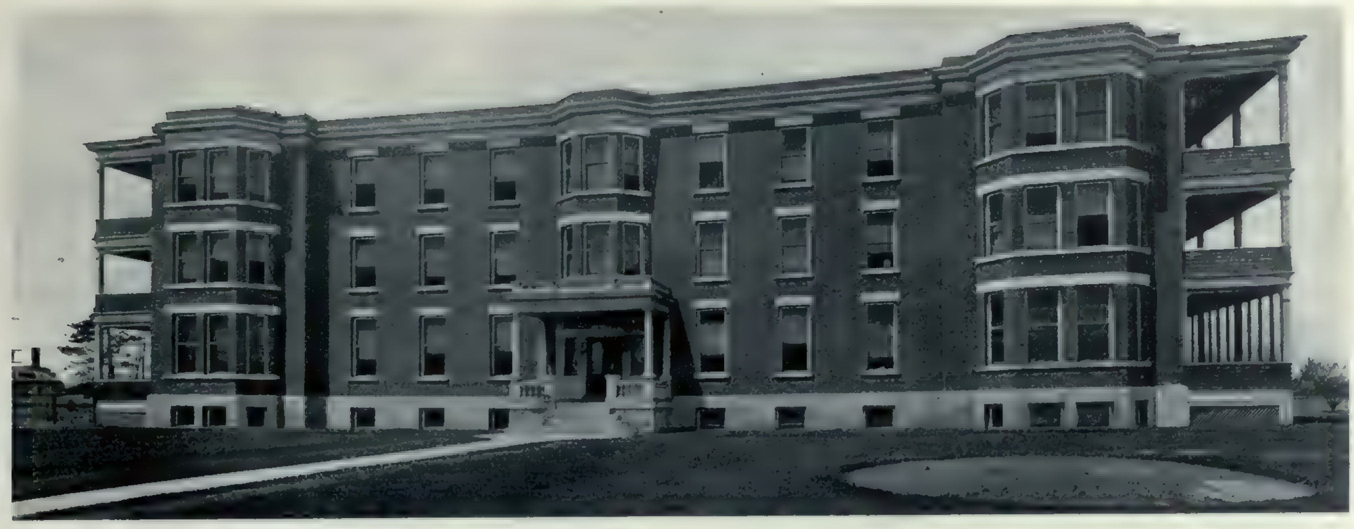


STAIRWAY AND CORRIDOR IN QUEEN MARY HOSPITAL.

The roof of centre portion of main building has recently been utilized for shelters for special cases where patients need direct sunlight on the affected parts of the body. The shelters are constructed of corrugated iron, the sides, rear and roof being closed in and the front left open. The patients are taken up to the shelters in the elevator in cots, and wheeled to their respective positions under the shelters.

The children's building is of similar design to the main building, and consists of a centre building with a wing on either side connected by corridors. On the ground floor of the centre building toward the front of building are the office clinic room, and large reception room; behind these is a large dining room with service pantry, to which food already prepared is brought up on a dumb waiter from kitchen in basement.

A feature of the centre building



NURSES' HOME, WESTON SANATORIUM. A. R. DENISON AND STEPHENSON, ARCHITECTS, TORONTO.

is a grand staircase rising from the centre of a spacious hall. Another feature is the entrance, which has ornamental stone mullions, and pilasters with large side lights of bevelled plate set in copper.

The ground floor of each wing is laid out for one large and one small ward, with necessary lavatory accommodation. The layout of the first floors of wing buildings is a duplicate of ground floor layout. The first floor of centre building is entirely given up to bedroom accommodation. Situated in the rear of this floor and immediately above pantries of ground floor, are two large sunrooms, with entrance from a wide corridor accessible to all bedrooms. The first floor of this building is served with dumb waiters running from kitchen in basement. A large school room is situated on the roof of centre building. The walls of school room are of brick up to sill level, and above are entirely of wood and glass, having glazed sash which can be removed during summer months and screens substituted.

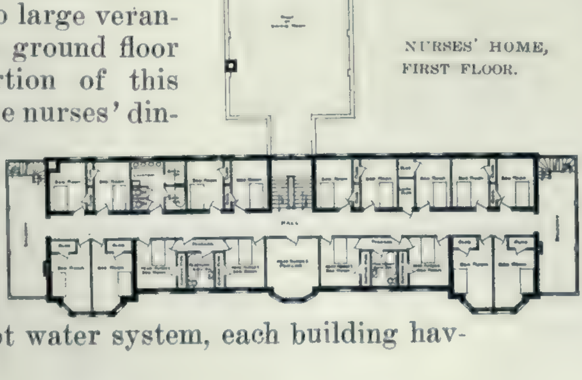
The nurses' home is somewhat isolated from the other buildings, and the design, though less ornate, is in keeping with same. There are three stories and a basement to this building. On the front portion of ground floor is a large reception room, and a music or entertainment room, each having large bay windows and brick fireplaces. These rooms are situated at either end of a wide corridor running across building and opening on to large verandas. On the ground floor of rear portion of this building is the nurses' dining room and service pantry.

The buildings are at present heated by hot water system, each building having a separate boiler. It is the intention of the Hospital Association at some future date to erect a central heating plant, plans and layout of which have already been prepared by the architects. The power house will be a two-story brick building, which will be located to the southwest of the grounds. The boilers will be on the ground floor. There will be two boilers installed when the building is erected, with space provided for an additional boiler when more buildings are added to the scheme. The boilers specified are tubular, each boiler being sixteen feet in length, seventy-two inches in diameter, and containing ninety-six three and one-half inch tubes. Each boiler will have 1,588 square feet of heating surface, and will be of one hundred and thirty horse power each. The feed pipes will be run under ground in continuous concrete conduits two feet wide and two feet high. The pipes will be covered with five-ply sectional asbestos air-cell covering.

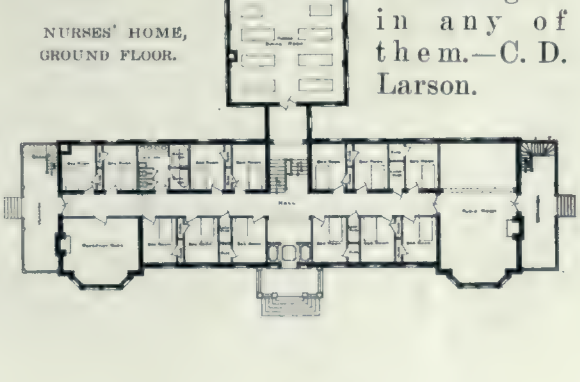
The floor above boiler room will be utilized as a laundry, with ironing and drying rooms, etc. Laundry will be fitted up with the most up-to-date machinery and laundry appliances.

All the buildings on the property are well drained, there being a modern drainage system with adequate septic tanks.

The average man cries for better opportunities, while the fact is that he is literally surrounded with better opportunities, but has not fitted himself to make good in any of them.—C. D. Larson.



NURSES' HOME, FIRST FLOOR.



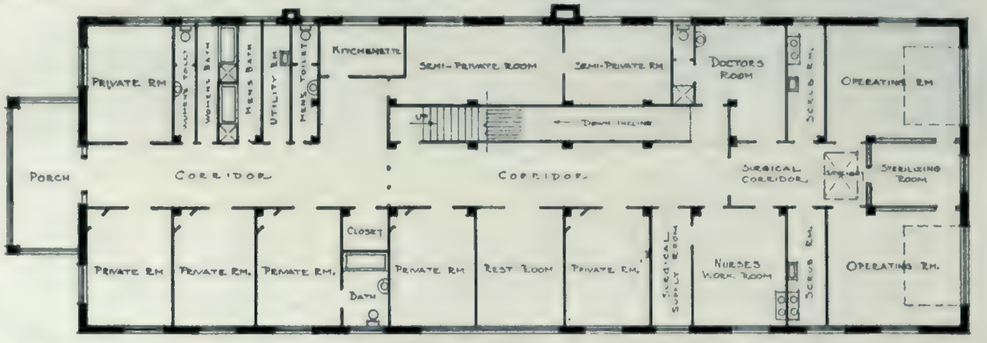
NURSES' HOME, GROUND FLOOR.

A Hospital With Unusual Features

Green Finish in Operating Room.
Inclines Instead of Staircases.

FRED S. CLINTON, M.D., F.A.C.S., president of the Oklahoma Hospital, Tulsa, Okla., in a recent issue of "Modern Hospital" describes the new institution of which he is head, it containing several features worthy of note.

The Oklahoma Hospital was planned and built to suit the needs and service of the modern requirements of an active industrial community. Its lines are simple and its construction is substantial. It is fireproof, and its compactness and completeness furnish a type for moderate-sized hospitals needed in localities where service without show is sought.



TYPICAL FLOOR PLAN OF OKLAHOMA HOSPITAL, SHOWING INCLINE USED IN PLACE OF STAIRCASE.

The accompanying plan of the third floor gives a good idea of all, and a close study may suggest valuable ideas for actual utilization of all available space. The use of inclines or ramps instead of elevators or stairs will appeal to many when constant service, economy of operation and upkeep, as well as lack of noise and dirt, are considered.

All four floors are above ground. All rooms have outside exposure. All doors open into rooms, have checks and transoms. The latter open from the top.

Part of corridor and the inclines. The inclines work any time of day or night, can be kept clean, and never get out of order. The side lights on incline permit ventilation when needed in semi-private rooms. The ceiling lights are separately wired, so one or all may be used at once. The silent signal over the door shows red through the transom to the occupant of bed, to the nurse in the hall, and at the switchboard in the office. This arrangement does away with one fixture by side of bed and enables the office to check time and place of service if necessary.

Each floor is complete within itself, having private, semi-private, bath, toilet and rest-rooms. The kitchenette has a refuse receptacle, refrigerator, warming oven, steam table, hot plates, tray shelves, dish rack, kitchen sink, cabinet for dishes, etc. Each floor has a bedpan sterilizer, utensil racks, etc. All private rooms are finished in different tints or colors. Children's rooms are made attractive with nursery decorations.

The emergency operating room at ambulance entrance facilitates handling of severely injured, poisoned, or other suitable patients with least disturbance to the household or to formal operations elsewhere. The X-ray and pathological laboratories are also on the ground floor. The engine room has the boilers, circulating hot-water heater, vacuum cleaner, incinerator, high-pressure boiler, etc., completely separated from the remainder of the floor by a solid wall and one room, so as to lessen heat and noise. The hospital has low-pressure steam heat, electric lights, sanitary plumbing, vacuum cleaner, silent signal system, inclines, intercommunicating telephones, circulating hot water and other modern conveniences. The inclines for a hospital of this size are a success, and, while the principle is not new, its application in this instance will so popularize it that every complete book on hospital construction hereafter will contain a description of this feature.

The operating-rooms on the third floor are practically above fly and dust line, and are completely separated from the other parts of the hospital, which prevents confusion and promotes the comfort of patient and friends. These rooms can be mechanically cleansed and flooded with sunlight.

One operating room is finished in standard white. The other is finished in green because Dr. Clinton believes that it has a more tranquilizing effect on the patient and is easier on the operator's eyes. He also uses black operating room sheets and towels because the black more sharply defines by contrast the field of operation and is less irritating to eyes.

CONSTRUCTION

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CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

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WESTON WRIGLEY - - **Editorial and Business Manager**
RICHARD G. LANGRILL . **Assistant Editor and Manager**

Vol. X Toronto, June, 1917 No. 6

Manufacturers Back Canadian Architects

The Toronto branch of the Canadian Manufacturers' Association, comprising over 800 firms and corporations, at their annual meeting, held in May, adopted a report of the Executive Committee protesting against "the growing and persistent discrimination by the Government departments against the employment of Canadian architects, engineers, contractors and manufacturers in the construction of public works."

The policy complained of is viewed by the Manufacturers' Association as inconsistent with the efforts which are being made through our universities and other educational institutions to develop into a high state of efficiency the young men of the country. It is felt that the conservation and development of the manhood resources of the country, no less, but rather more, than our material resources, are the concern of the whole country.

That the Manufacturers' Association are consistent in the stand they take in favoring the development of Canadian brains and industry is shown by the fact that thirty-six scholarships of $25 each are given by their members to students at the Central Technical School, Toronto.

The governments of Canada, both national and provincial, should be the first to recognize the importance of employing the best Canadian architects and engineers on Canadian public works, and they should be the last to depart from this principle.

War Creates Need For Hospitals

Dr. Herman Biggs, Health Commissioner of the State of New York, who has just returned from France, draws attention to the spread of the great white plague, which since the outbreak of the war has made enormous strides and has reached a point where, if the war were to be terminated to-morrow, there would be 500,000 active cases of tuberculosis to be dealt with. Today there are in France virtually no facilities for caring for these, or even for supervising them.

Before the war, France had done practically nothing for the prevention of the spread of tuberculosis, except for some private institutions, the accommodation totalling only about 150 beds, and the authorities had never taken any official cognizance of the disease, no notification of its outbreak being required anywhere in France.

The troops, instead of living in tents and in the open air when they go to the front, live in trenches, often wet and always damp, always cold, or they are in dugouts under ground, still more damp and colder. Then, relieved from duty in the front fighting lines, they are billeted in peasant houses in towns and villages, or in farmhouses or outbuildings near the front, in very much overcrowded rooms, without ventilation or fresh air or sunlight, and even with very little diffused daylight. These peasant houses in France are provided with few windows and doors, these being rarely open, owing to the strong national aversion of the French people to fresh air.

◆

Canada's Favorable Trade Balance

The unprecedentedly favorable balance of trade reported by the Department of Trade and Commerce at Ottawa for the 1916 fiscal year is looked upon with considerable satisfaction because it demonstrates that Canada has established herself as a supply base for the Allies during the war, and proves the contention that the Dominion can hold her place in international competition.

In 1913 there was an excess of $309,447,000 in imports over exports, but the figures declined in two years until the excess of imports over exports was $35,934,000. In 1916 the excess of exports over imports was $249,089,000, and during the year ending March, 1917, the favorable balance amounted to $333,881,000.

Canada's trade during the 1916 fiscal year totalled $2,249,170,171. The exports aggregated $1,151,375,768, against $741,610,653 for the previous fiscal year.

Canada's exports for the first four months of the current year were $354,891,404, as compared with $285,168,625 for the corresponding period a year ago, and imports were $329,497,238, as compared with $214,008,068.

CONSTRUCTION NEWS

Information of Special Interest to Architects, Contractors, and Manufacturers. Construction Building Reports will Give You Up-to-date Information Every Day on all New Buildings About to be Erected or in Course of Erection.

BUSINESS BUILDINGS.

Chatham, Ont.—Reid & Brown, 63 Esplanade east, Toronto, have been awarded the steel work contract in an addition to a school for the Public School Board for the City of Chatham, to cost $35,000.

Guelph, Ont.—J. J. Mahoney, 45 Kent street, has been awarded the plastering contract in an office building for C. L. Dunbar, Douglas street, to cost $10,000; Geo. Walker, 32 Tiffany street, has been awarded the carpenter contract; W. A. Mahoney, 73 Quebec street, is the architect.

Guelph, Ont.—Robert Dunbar, Guelph, has been awarded the mason contract in an office building for C. L. Dunbar, Douglas street, to cost $10,000; Dennis & Bennett, Guelph, have been awarded the painting and glazing contracts; Howard Brothers have been awarded the roofing contract; Stevenson & Malcolm, Guelph, have been awarded the heating, plumbing and electric wiring contracts; W. A. Mahoney, Quebec street, is the architect.

Hamilton, Ont.—W. Finden, 291 Catharine street north, has been awarded the concrete and cut stone contracts in a parish hall for St. Luke's Church, to cost $12,000; the Hamilton Bridge Works Company, Limited, Hamilton, have been awarded the steel contract; W. G. Brown, Clyde Building, is the architect.

Hamilton, Ont.—Pigott, Healy Company, Hamilton and Detroit, have been awarded the concrete and mason contracts in a factory and office building for the Canadian Westinghouse Company, to cost $200,000; Adam Clark, 7 Main street west, Hamilton, has been awarded the plumbing contract; Prack & Perrine, Lumsden Building, Toronto, are the architects.

Thornhill, Ont.—H. F. Sheldon, Thornhill, has been awarded the general contract for the erection of a bank for the Sterling Bank; Langley & Howland, 112 King street west, Toronto, are the architects.

Toronto, Ont.—Archibald & Holmes, Excelsior Life Building, have been awarded the mason, concrete and cut stone contracts in an office building for the Toronto Harbor Commission, 50 Bay street, to cost $150,000; Chapman & McGiffin, 95 King street east, are the architects.

Toronto, Ont.—Witchall & Son, 156 St. Helen avenue, have been awarded the mason contract in a bank building for the Dominion Bank, King and Yonge streets, to cost $20,000, at the corner of Yonge and St. Clair avenue; Darling & Pearson, 2 Leader lane, are the architects.

CIVIL ENGINEERING.

Eastview, Ont.—The Town of Eastview is preparing plans for a bridge, to cost $20,000.

Kerwood, Ont.—R. Waltham, Kerwood, has been awarded the general contract for the erection of two bridges for the Township of Metcalfe; Harry Thompson, R. R. No. 2, Kerwood, is the clerk.

Peterboro, Ont.—A by-law has been passed authorizing the erection of a bridge across Hunter street, to cost $280,000.

Port Dover, Ont.—The Norfolk County Council, Simcoe, Ont., contemplates rebuilding the swing bridge over the mouth of the Lynn River.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Cobourg, Ont.—The Military Hospital Commission, Ottawa, contemplates the erection of an addition to their hospital here; Captain W. S. Symons, 14 Vittoria street, Ottawa, is the architect.

Hamilton, Ont.—Canadian Allis-Chalmers Company, Toronto, have been awarded the steel work contract in a theatre for Marcus Loew's Theatre Company, Toronto, on King street, to cost $250,000; Ritchie Cut Stone Company, 191 Grant street, have been awarded the cut stone contract; Thos. Irwin & Sons, 22 McNab street, have been awarded the sheet metal and roofing contracts; Architectural Plastering Company, New York, have been awarded the plastering contract; F. G. Roberts Company, 106 Wells street, Toronto, have been awarded the painting and glazing contracts; Thos. W. Lamb, 17 St. John street, Montreal, and New York, is the architect, and P. H. Secord & Sons, Brantford, are the general contractors.

Preston, Ont.—Architect J. Mickler, Duke street, is preparing plans for a club house for the Preston Bowling Club.

Sarnia, Ont.—The Sarnia Golf Club contemplates the erection of a club house.

Toronto, Ont.—The Dominion Bridge Company, Imperial Life Building, have been awarded the steel contract in a moving picture theatre being erected on the southwest corner of Richmond and Victoria streets; the Peerless Artificial Stone, Limited, Coxwell avenue, have been awarded the artificial stone contract; the Canadian Ornamental Iron Company, 88 River street, have been awarded the iron stairs contract; the Frank Farrington Company, Detroit and Toronto, are the general contractors; Howard Crane, Detroit, is the architect; Hynes, Feldman & Watson, 105, Bond street, Toronto, are the associate architects.

Welland, Ont.—Rachor & Hyatt, 86 Main street west, have been awarded the painting and glazing contracts in alterations to a theatre for P. Whalley, 92 Main street, to cost $11,000; Upper & Muckler, Welland, have been awarded the electric wiring contract; Charles Haget, Welland, has been awarded the heating and plumbing contracts; C. M. Borter, Niagara Falls, is the architect, and Ryan & Gardner, Welland, are the general contractors.

FIRE LOSSES.

Calgary, Alta.—The Dominion Government Observatory at the summit of Sulphur Mountain was completely destroyed by fire.

Fort William, Ont.—The entire plant of the Copp Stove Company was destroyed by fire; loss $500,000.

Kingsville, Ont.—The car barns of the W. E. & L. S. Interurban Railway were destroyed by fire; loss $50,000.

Moose Jaw, Sask.—The warehouse of the Western Oil Company in the Canadian Northern Railway yards here was destroyed by fire; loss $6,000.

Nicolet Falls, Que.—The pulp and sash door factory of the Lotbiniere Lumber Company was destroyed by fire; loss $80,000.

Paris, Ont.—The barracks of the Salvation Army at Paris were destroyed by fire.

Pembroke, Ont.—The lumber mill of the Colonial Lumber Company at Pembroke was destroyed by fire; loss $140,000.

Peterboro, Ont.—The transformer of the Canadian General Electric Company at Peterboro was destroyed by fire; loss $8,000.

Quebec, Que.—The plant of the Fraserville Chair Company was destroyed by fire; loss $30,000.

St. Thomas, Ont.—The hotel of R. H. McLean & Son was destroyed by fire; loss $25,000.

Toronto, Ont.—The factory of Cluff Brothers on Sterling road was destroyed by fire; loss $250,000.

Windsor, Ont.—The warehouse of Thos. Langlois, 2 Windsor avenue, was destroyed by fire; loss $5,000.

MISCELLANEOUS.

Hamilton, Ont.—R. M. Smith, 401 Barton street east, has been awarded the electric wiring contract in a garage for W. O. Sealey, 61 Hunter street, to cost $10,000; Bloom & Britton, 121 James street south, have been awarded the plumbing contract; Richard Tope, 191 Robinson street, has been awarded the mason contract.

Hamilton, Ont.—Cook & Smith, Hamilton, have been awarded the carpenter contract in an amusement building for Addie Burke, 17 Mulberry street, to cost $24,000; F. Knowles, Hamilton, has been awarded the electric work contract. George Frid & Company, Limited, Bank of Hamilton Building, have been awarded the general contract for the erection of an addition to the garage and showrooms of the McLaughlin Motor Car Company, to cost $20,000; the Hamilton Bridge Works Company, Limited, have been awarded the steel work contract.

Hamilton, Ont.—Thos. Irwin & Son, 22 McNab street east, have been awarded the sheet metal contract in an addition to a garage and showrooms for the McLaughlin Motor Car Company, George and Bay streets, to cost $20,000; R. M. Smith, 404 Barton street east, has been awarded the electric wiring contract; the Hamilton Bridge Works, Hamilton, and Reid & Brown, Toronto, have been awarded the steel contract; Leeks & Potts, 112 King street west, have been awarded the painting and glazing contracts; Adam Clark, 7 Main street west, has been awarded the plumbing and heating contracts; George Frid & Company, Bank of Hamilton Building, are the general contractors, and G. J. Hutton, Bank of Hamilton Building, is the architect.

Listowel, Ont.—George H. Fritz, Listowel, Ont., has been awarded the mason contract in a spinning mill for the Perfect Knit Mills, Limited, to cost $11,000.

Niagara Falls, Ont.—Ireland & Dinham, Glenholme avenue, have been awarded the general contract for the erection of a fire hall for the City of Niagara Falls, to cost $20,750; C. M. Borter, 102 Main street, is the architect.

Ottawa, Ont.—Alexander Garvock, 136 Lewis street, has been awarded the general contract for the erection of a workshop for the City of Ottawa, to cost $17,542.

Ottawa, Ont.—N. Poirier, 193 Cathcart street, has been awarded the general contract for the erection of a laundry for the Grey Nuns, to cost $20,500; J. D. Cheve, 163 Notre Dame street, Hull, Quebec, is the architect.

Owen Sound, Ont.—The Canadian Pacific Railway contemplates improvements to their coal docks at Owen Sound.

Pembroke, Ont.—The Colonial Lumber Company will rebuild their sawmill, which was destroyed by fire.

Ridgetown, Ont.—The Council has authorized the city that they can erect cement tanks on the streets for the purpose of storing oil.

Toronto, Ont.—The City of Toronto contemplates the erection of garages for the Street Cleaning Department, to cost $25,000.

Toronto, Ont.—The Canada Hardware, Limited, 39 Richmond street east, have been awarded the hardware contract in a lodge building for the Masonic Temple Corporation of Toronto, Limited, to cost $175,000; W. F. Sparling & Company, Trust and Guarantee Building, are the architects.

Toronto, Ont.—Witchall & Son, 156 St. Helen's avenue, have been awarded the general contract for the erection of a mausoleum for the Toronto General Burying Ground at Mount Pleasant Cemetery, to cost $200,000; McIntosh Granite Company, 1119 Yonge street, have been awarded the granite contract; Darling & Pearson, 2 Leader lane, are the architects.

Toronto, Ont.—Hepburn & Disher, 18 Van Horne street, have been awarded the steel contract in a garage for A. Grassie, Toronto, to cost $15,000; J. M. Cowan, 122 Margueretta street, is the architect. Plans have been prepared for a garage for A. Peters, 109 Montrose avenue, to be built on Bathurst street, to cost $10,060. McGregor & McIntyre, 1139 Shaw street, have been awarded the steel contract in an addition to an art gallery for B. M. & T. Jenkins, 424 Yonge street, to cost $40,000; the Trussed Concrete Steel Company of Canada, Limited, 34 King street west, have been awarded the metal sash contract; Hoidge & Sons, 34 Price street, have been awarded the plastering contract; Hudson Electrical Company, 18 Toronto street, have been awarded the electric contract; Otis-Fensom Company, 50 Bay street, have been awarded the elevator contract; the Canadian General Fire Extinguisher Company, 1200 Dundas street, have been awarded the sprinkler contract; H. Williams, 23 Toronto street, has been awarded the roofing contract; Sproatt & Rolph, 36 North street, are the architects.

Whitby, Ont.—Jackson-Lewis Company, Bell Telephone Building, Toronto, have commenced work on an amusement hall for the Military Hospital Commission, Toronto, to cost $60,000.

Windsor, Ont.—Maul & Rigg, McDougall street, have been awarded the cut stone contract in an auto service station for W. C. Kennedy, Chatham street west, to cost $30,000; Jos. L'Heureux, Wyandotte street, has been awarded the sheet metal, roofing, heating and plumbing contracts; Otis-Fensom Elevator Company, 50 Bay street, Toronto, have been awarded the elevator contract; R. Westcott & Company, Windsor, are the general contractors, and G. Jacques & Company, Windsor, are the architects.

PLANTS, FACTORIES AND WAREHOUSES.

Brantford, Ont.—The Kitchen Overall & Shirt Company, 11 Queen street, contemplates the erection of a factory on Durham and George streets.

Belleville, Ont.—The Rogers Cement Company, 28 King street west, Toronto, have been awarded the cement contract in a storage plant for Graham Company, Limited, Belleville, to cost $100,000; the Trussed Concrete Steel Company of Canada, Limited, 34 King street west, Toronto, have been awarded the steel sash and reinforcing contracts; Frankfort Cooperage Company, Frankfort, Ont., have been awarded the lumber contract; Bennett & Wright, 72 Queen street east, Toronto, have been awarded the plumbing, heating and wiring contracts; the Armstrong Cork Company, Toronto, have been awarded the insulation contract; the Canadian Ice Machine Company, 82 Chestnut street, Toronto, have been awarded the refrigeration contract; Otis-Fensom Company, 50 Bay street, Toronto, have been awarded the elevator contract; Eureka Refrigerator Company, 31 Brock avenue, Toronto, have been awarded the cold storage doors contract; W. F. Sparling & Company, 120 Bay street, are the architects.

Elmira, Ont.—The Elmira Machinery & Transmission Company, Elmira will erect an addition to their factory.

Galt, Ont.—The Galt Building Products, Limited, contemplates the erection of a factory.

Galt, Ont.—George H. Thomas & Son, Galt, have been awarded the general contract for the erection of an addition to the factory of Newlands & Company, Galt, to cost $7,000; W. Evans, 30 Water street north, is the architect.

Hamilton, Ont.—The Steel Company of Canada, Limited, contemplates an extension to their plant costing about $100,000.

Hamilton, Ont.—The National Machinery Company, 76 Wellington street north, contemplates the erection of a factory at the corner of Sherman and Biggar streets, to cost $60,000.

Hamilton, Ont.—Thos. Irwin & Sons, 22 McNab street south, have been awarded the roofing, sheet metal, painting and glazing contracts in a factory and office building for the National Abrasive Company, Boston and Amesbury, Mass.

London, Ont.—Steel Lockers Company, 426 Talbot street, contemplates the erection of a factory.

London, Ont.—R. G. Wilson, 195 College street, has been awarded the general contract for the erection of an addition to the factory of Gorman Eckert, London, Ont., to cost $15,000.

Mitchell, Ont.—A. Burritt & Company, Mitchell, will erect a new factory, to cost $20,000, at Mitchell.

Ottawa, Ont.—The Ottawa Tile Company, 289 Laurier street, have been awarded the tile contract in a factory for the Ottawa Car Company, Albert street, to cost $90,000; McFarlane & Douglas, Central Chambers, have been awarded the sheet metal contract; Murphy & Morrow, Ottawa South, have been awarded the plastering contract; W. J. Carson, 293 Laurier street west, has been awarded the painting and glazing contracts; W. E. Noffke, Ottawa, is the architect.

Owen Sound, Ont.—The Union Cement Company will erect an addition to their plant at Owen Sound, to cost $275,000; the Fuller Engineering Company, Allentown, Pa., are the architects and general contractors.

Sarnia, Ont.—Architects James, Loudon & Hertzberg, Excelsior Life Building, Toronto, have prepared plans for an addition to the factory of the Mueller Manufacturing Company.

Saskatoon, Sask.—Hazelton & Walin, Limited, Winnipeg, have been awarded the general contract for the erection of a warehouse for the T. Eaton Company, Limited, to cost $150,000; the Otis-Fensom Company, 50 Bay street, Toronto, have been awarded the elevator contract; the Canadian General Fire Extinguisher Company, Toronto, have been awarded the sprinkler system contract; Green & Litster, Winnipeg, have been awarded the plumbing and heating contracts.

Toronto, Ont.—Adams Manufacturing Company, 17 Adelaide street west, have commenced work on repairing their factory on King street, which was destroyed by fire some time ago. Architects Chapman & McGiffin, 95 King street east, are preparing plans for a glue factory for W. Harris & Company, 994 Danforth avenue. The Imperial Munitions Board, 56 Church street, contemplates the erection of an aviation plant at Ridley Park grounds, Toronto.

Toronto, Ont.—J. M. Vaughn, 46 Summerhill Gardens, Toronto, has been awarded the general contract for the erection of a warehouse for Sam Jardine, 357 Eastern avenue, to cost $9,000. Waldon & Spittal, Toronto, have been awarded the mason contract in an addition to the factory of the Canadian Dyers' Association, Limited, 2 Liberty street; S. Hogg, 242 Markam street, has been awarded the carpenter contract; J. Francis Brown, Board of Trade Building, is the architect. S. L. Yolles and Harry Rotenberg, 67 Baldwin street, have been awarded the general contract for the erection of a factory for the Willard Chocolate Company, Limited, 260 Spadina avenue.

Windsor, Ont.—The Maxwell Motor Company, Sandwich street west, contemplates the erection of a factory on Howard avenue. The Chalmers Motor Company, Ford, Ont., will erect their factory, which was destroyed by fire, at Windsor, instead of at Ford, Ont.

PUBLIC BUILDINGS AND STATIONS.

Hamilton, Ont.—Architect A. W. Peene, Clyde Block, is preparing plans for a hydro sub-station for the Hamilton Hydro Electric Commission, to cost $75,000.

London, Ont.—Architect E. V. Buchanan, City Hall, is preparing plans for an addition to a sub-station owned by the Utilities Board, London, to cost $30,000.

Orillia, Ont.—The Grand Trunk Railway Company contemplates the erection of a station at Orillia.

Renfrew, Ont.—Work has commenced on a power sub-station for the Calabogie Light & Power Company, to cost $20,000.

RESIDENCES, STORES AND FLATS.

Ford, Ont.—Architects G. Jacques & Company, Hydro Building, are preparing plans for a residence for C. S. Davis, Detroit, to cost $5,500.

Guelph, Ont.—Johnson & Williams, 20 Central street, have been awarded the mason contract in a residence and garage for Dr. M. J. Ruddell, Wyndham street, to cost $8,000; G. A. Scroggie, 21 Suffolk street, has been awarded the carpenter contract; Wm. Harris, 35 Oliver street, has been awarded the plastering contract; W. W. Stewart, 11 Quebec street west, has been awarded the electric wiring contract; Albert Smith, Cork street, has been awarded the heating, plumbing and galvanized iron contracts; W. A. Cowan, Guelph, is the architect.

Hamilton, Ont.—George Pyle, Barton street east, has been awarded the plumbing contract in a residence for Dr. Stewart, Beach street, to cost $7,000; John Poag & Company, Westinghouse avenue, are the general contractors. Hannaford Brothers, 232 Robinson street, have been awarded the plastering contract in a departmental store for Grafton & Company, James street north, to cost $100,000; Smith & Omand, 219 Ferguson avenue south, have been awarded the painting and glazing contracts; G. L. Hutton, Bank of Hamilton Building, is the architect.

Hamilton, Ont.—J. E. Riddell & Son, 14 Ferguson street north, have been awarded the sheet metal contract in a residence for I. G. Thompson, 4 Ravencliffe avenue, to cost $5,000; Hannaford Brothers, 232 Robinson street, have been awarded the plastering contract; Goodale & Laidlaw, 20 Hunter street east, have been awarded the painting contract; Alexander McKenzie, 164 Wentworth street south, has been awarded the heating and plumbing contracts; Halcombe Brothers, Hamilton, have been awarded the glazing contract; Donaldson & Patterson, 229 Bay street, have been awarded the carpenter contract, and Isbister Brothers, 142 Emerald street south, have been awarded the mason contract.

Hamilton, Ont.—Harry Foster, 1194 King street east, has been awarded the painting and glazing contracts in a residence for Dr. Stewart, Beach street, to cost $7,000; Geo. Pyle, 374 Barton street south, has been awarded the plumbing contract; John Poag & Company, Westinghouse avenue, are the general contractors. Architect F. W. Warren, Bank of Hamilton Building, is preparing plans for an apartment house on King street east, to cost $25,000. Charles Holcombe, 160 Markland street, has been awarded the painting and glazing contracts in a residence for Donald & Patterson, 229 Bay street, to cost $5,500; A. McKenzie, 164 Wentworth street south, has been awarded the heating contract.

London, Ont.—Harry Hayman, 491 Ontario street, has been awarded the general contract for the erection of a residence for W. MacKeowen, London, to cost $10,000; Watt & Blackwell, Bank of Toronto Building, are the architects.

London, Ont.—Sam Foxworth, 616 Waterloo street, has been awarded the general contract for the erection of a residence for Fred Henderson, St. George Apartments, to cost $8,000; W. G. Murray, Dominion Savings Building, is the architect.

Niagara Falls, Ont.—Architect Carl Gardner, Morrison street, is preparing plans for a garage and residence for W. C. Pretty, 751 Ferry street, to cost $7,000.

Ottawa, Ont.—A. G. Marshall, 15 O'Connor street, has been awarded the general contract for the erection of a residence for H. D. Marshall, 197 Sparks street, to cost $7,500; Richards & Abra, 126 Sparks street, are the architects.

Ottawa, Ont.—Jas. Patterson, 33 Fulton street, has been awarded the mason contract in a residence for A. W. Grant, 16 Powell avenue, on Carling avenue, to cost $5,000; Thos. Patterson, 70 Rosedale avenue, has been awarded the plastering contract; J. H. Baron, 420 Gladstone avenue, has been awarded the plumbing contract; D. A. Howard, 185 Strathcona avenue, is the general contractor. Jas. Patterson, 33 Fulton street, has been awarded the mason contract in a residence for George Cordukes, 85 Nepean street, on Cobalt avenue, to cost $5,000; Thos. Patterson, 70 Rosedale avenue, has been awarded the plastering contract; J. H. Baron, 420 Gladstone avenue, has been awarded the painting and glazing contracts; W. H. Murphy, 287 Lyon street, has been awarded the heating contract; J. R. McLennan, 240 Bank street, has been awarded the plumbing contract; D. A. Howard, 185 Strathcona avenue, is the general contractor. Wm. St. George & Sons, Ottawa, have been awarded the mason contract in an addition to the store of A. J. Freiman, 73 Rideau street, to cost $25,000; McFarlane-Douglas Company, 250 Slater street, have been awarded the sheet metal contract; Davidson & Crooks, 16 Hamilton avenue, have been awarded the iron column contract; R. Holmes, 80 Arlington avenue, is the general contractor, and J. A. Ewart, Booth Building, is the architect. E. Manette, Ottawa, has been awarded the mason contract in a residence to be erected on Broadway avenue, to cost $6,000; Ed. Wentzleff, 249 McKay street, has been awarded the carpenter contract; Murphy & Morrow, Billings avenue, have been awarded the plastering contract; Duford, Limited, 70 Rideau street, have been awarded the painting and glazing contracts; J. Ellacott, 226 Bank street, has been awarded the electric wiring contract; Millson & Burgess, Union Bank Building, are the architects.

Port Dalhousie, Ont.—Newman Brothers, St. Catharines, Ont., have been awarded the general contract for the erection of a girls' home for the Canadian Consolidated Rubber Company, to cost $30,000.

Richmond Hill, Ont.—B. H. Lasher, Toronto, has been awarded the heating and plumbing contracts in a residence for Harry Moyle, Richmond Hill, to cost $10,000; W. H. Graham, Richmond Hill, has been awarded the general contract; F. S. Mallory, 65 Adelaide street east, is the architect.

Toronto, Ont.—Plans have been prepared for a store and apartments for E. D. Morris, 2167 Queen street east, to cost $25,000.

Toronto, Ont.—Architect W. Bredin Galbraith, Bank of Hamilton Building, is preparing plans for a residence to be erected in Oakwood District, to cost $6,000. The Earlscourt Children's Home, 46 St. Clair Gardens, contemplates the erection of a children's home.

Toronto, Ont.—Plans have been prepared for a residence and garage for W. P. Levack, 519 Roxton road, to cost $5,000. Plans have been prepared for a residence for J. S. Case, 124 Grenadier road, to be erected on Lauder avenue, to cost $5,000. H. N. Dancy & Son, Canadian Pacific Railway Building, have been awarded the mason contract in an apartment for Mrs. E. D. Y. Cohen, 26 Avoca avenue, to cost $15,000; F. Markham, 51 Orchard View boulevard, has been awarded the carpenter contract; Langley & Howland, 112 King street West, are the architects.

Toronto, Ont.—Architect Jas. Mitchell, 55 Isabella street, is preparing plans for a residence for E. B. Varey, 174 Balmoral avenue, to cost $5,700. Plans have been prepared for an apartment house for Jas. Stewart, 627 Crawford street, to cost $20,000. Plans have been prepared for a residence for Jas. McCarron, Vandorf, Ont., to cost $6,500. Architect P. H. Finney, 79 Adelaide street east, is preparing plans for a residence for J. H. MacLaren, 159 Briar Hill avenue, to cost $5,000.

Windsor, Ont.—Wells & Gray, Bank of Commerce Building, have been awarded the general contract for the erection of an addition to the residence of Gordon McGregor, Victoria avenue, to cost $10,000.

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SCHOOLS, CHURCHES AND COLLEGES.

Bracebridge, Ont.—The Public School Board of Bracebridge contemplates the erection of a new high school.

Bridgeburg, Ont.—Sommerville & Gilworth, Welland, Ont., have been awarded the general contract for the erection of a school for the Board of Education for the City of Bridgeburg, to cost $23,000; Wm. Delaney, Simcoe, Niagara Falls, has been awarded the painting and glazing contracts; Niagara Electric Company, Victoria avenue, Niagara Falls, have been awarded the electric contract; W. G. Read, 489 Victoria avenue, Niagara Falls, has been awarded the heating and plumbing contracts; C. M. Borter, Niagara Falls, Ont., is the architect.

Chatham, Ont.—The Canadian Contractors and Builders, Limited, Brockville, have been awarded the general contract for the erection of an addition to the Queen Mary School, at a cost of $44,500; John Methuen, Victoria Block, is the architect.

Haileybury, Ont.—Architects Ellis & Ellis, Manning Chambers, Toronto, are preparing plans for improvements to a school of the Public School Board, to cost $13,000.

Hamilton, Ont.—Mitchell & Ridell, 45 Lewiston avenue, have been awarded the mason contract in an addition to a school on the Mountain Top, to cost $10,000; W. Evans, 51 Lamoreaux street, has been awarded the carpenter contract; R. J. Passmore, 530 Wellington street, has been awarded the plastering contract; A. M. McKenzie, 45 Ferguson street south, has been awarded the painting and glazing contracts; Adam Clark, 7 Main street west, has been awarded the heating and plumbing contracts; W. G. Brown, Clyde Block, is the architect.

Kenora, Ont.—Architect Arthur J. Wills, 204 Sterling Bank Building, Winnipeg, is preparing plans for a church for the St. Alban's Protestant Cathedral, to cost $20,000.

Kingston, Ont.—The St. James Church, Kingston, contemplates the erection of a Sunday-school, to cost $15,000.

Ottawa, Ont.—Architect J. A. Karch, 187 St. Denis street, Montreal, is preparing plans for a church for the Ruthenian Roman Catholic congregation, to cost $12,000.

South Porcupine, Ont.—P. H. Secord & Sons, Limited, Brantford, have been awarded the general contract for the erection of a school for the Public School Board of the City of South Porcupine, to cost $5,000.

St. Benjamin, Que.—A. Roy & Company, Three Rivers, Que., have been awarded the general contract for the erection of a church for the trustees of St. Benjamin, to cost $17,000; P. Levesque, 115 St. John street, Quebec, Que., is the architect.

Stouffville, Ont.—John Innes, Richmond Hill, Ont., has been awarded the general contract for the erection of a school for the Public School Board of the City of Stouffville, to cost $30,000.

Stratford, Ont.—The Central Methodist Church contemplates the erection of a Sunday-school, to cost $17,000.

Trenton, Ont.—Schultz Brothers, Brantford, Ontario, have been awarded the general contract for the erection of a school for the Public School Board, to cost $55,000; S. B. Coon & Son, 810 Excelsior Life Building, Toronto, are the architects.

Vankleek Hill, Ont.—The plans of Architects MacVicar & Heriot, 104 Union avenue, Montreal, for a church for the Presbyterian Congregation, to cost $20,000, have been accepted.

Windsor, Ont.—J. McCrea, 36 Pitt southeast, has been awarded the general contract for the erection of a church for the Sacred Heart Church, Curry street, to cost $9,000.

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CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

Ross Memorial Hospital, Montreal.

Brick, National Brick Co., Montreal.
Brick, Fancy, Dartnell, Ltd., Montreal.
Beds, Ideal Bedding Co., Toronto.
Casements, (Crittal), S. L. Hammond, Toronto.
Clocks, E. Howard Clock Co., Boston.
Doors, Metal, A. B. Ormsby Co., Toronto.
Electric Fixtures, McDonald & Willson, Montreal.
Electric Equipment, L. K. Comstock Co., New York.
Elevators, Otis-Fensom Elevator Co., Toronto.
Expanded Metal, Clarence Noble, Toronto.
Fire Doors, A. B. Ormsby Co., Toronto.
Fuel Economizer, E. S. Manny Co., Montreal.
Flooring, Cork, Can. Johns-Manville Co., Montreal.
Flooring, Linoleum, T. Eaton Co., Toronto.
Flooring, Terrazzo, Walker Hardware Co., Montreal.
Grilles, John Watson & Son, Montreal.
Glass, Pilkington Bros., Montreal.
Glass (Globes), McDonald & Willson, Montreal.
Hardware, Yale & Towne, St. Catharines, and Walker Hardware Co., Montreal.
Hose Reels, Montgomery Faultless Hose Reel Co., Toronto.
Heaters, E. S. Manny Co., Montreal.
Heat Grilles (Bronze), John Watson & Co., Montreal.
Heat Regulators, Garth & Co., Montreal.
Interior Woodwork, Geo. Roberts, Montreal.
Kitchen Equipment Co., Sparrow & Co., Toronto.
Marble, Vermont Marble Co., Peterboro.
Memorial Tablet (Bronze), Robt. Mitchell, Montreal.
Memorial Tablet (Marble), Smith Marble & Construction Co., Montreal.
Nurses' Call System, Holtzer-Cabot Co., Boston, and Signal Systems, Ltd., Toronto.
Ornamental Iron, John Watson & Co., Montreal.
Paints, Sherwin-Williams Co., Montreal, and Sturgeons, Ltd., Toronto.
Plumbing, Garth & Co., Montreal.
Plumbing Fixtures, J. L. Mott Co., Montreal, and Imperial Products, Ltd., Toronto.
Plaster, E. G. M. Cape & Co., Montreal.
Refrigeration, Can. Johns-Manville Co., Montreal.
Refrigeration Machinery, Canadian Ice Machine Co., Toronto.
Reinforcement, U. S. Steel Products Co., Montreal.
Roofing, G. W. Reed & Co., Montreal.
Screens, Watson, Ltd., Bradford, Ont.
Steel Equipment, King-Sherrer Co., New York.
Stone, E. G. M. Cape Co., Montreal.
Sterilizers, Barnstead Co., Boston.
Structural Iron, Dominion Bridge Co., Montreal.
Telephone System, L. K. Comstock Co., New York.
Terra Cotta, Montreal Terra Cotta Co., Montreal.
Tile, Walker Hardware Co., Montreal.
Vaults, J. & J. Taylor, Ltd., Toronto.
Ventilators, B. F. Sturtevant Co., Montreal.
Varnish, Sherwin-Williams Co., Montreal.
Water Distillers, Barnstead Co., Boston.
General Contractors, E. G. M. Cape & Co., Montreal.
Heating Engineers, McMullen, Riley & Durey, Montreal.

Mount Hamilton Hospital, Hamilton.

Brick, Don Valley Brick Works, Toronto.
Boilers, Spencer Heater Co., Toronto.
Beds, Ideal Bedding Co., Toronto.
Casements, A. B. Ormsby Co., Toronto.
Cement, Union Cement Co., Owen Sound.
Concrete Hardener, Master Builders Co., Cleveland.
Doors (Metal), A. B. Ormsby Co., Toronto.
Door Frames (Metal), A. B. Ormsby Co., Toronto.
Electric Equipment, Cully & Brey, Hamilton.
Elevators, Otis-Fensom Elevator Co., Toronto.
Expanded Metal, Trussed Concrete Steel Co., Walkerville.
Flooring, Concrete, W. H. Cooper, Hamilton.
Flooring, Terrazzo, Kent Garvin Co., Hamilton.
Hardware, Belleville Hardware & Lock Co., Belleville.
Hardware (Jobber), Kent Garvin Co., Hamilton.
Hollow Tile, National Fireproofing Co., Toronto.
Heat Regulators, Can. Powers Regulator Co., Toronto.
Interior Woodwork, Frid Construction Co., Hamilton.
Kitchen Equipment, Gurney Foundry Co., Toronto, and Brantford Oven and Rack Co., Brantford.
Lockers, Canada Wire & Iron Goods Co., Hamilton.
Marble, Vermont Marble Co., Peterboro.
Nurses' Call System, Bryant Electric Co., Bridgeport, Conn., and Northern Electric Co., Montreal.
Ornamental Iron, Canada Wire & Iron Goods Co., Hamilton.
Paints, Adams & Elting Co., Toronto, and Sturgeons, Ltd., Toronto.
Plumbing Fixtures, Cluff Bros., Toronto.
Pumps, Smart-Turner, Ltd., Hamilton.
Refrigeration Machinery, Canadian Ice Machine Co., Toronto.
Reinforcement, Trussed Concrete Steel Co., Walkerville.
Roofing, Thos. Irvin, Hamilton.
Sash Cord, Hercules Brand.
Screens, Higgin Mfg. Co., Toronto.
Steel Furniture, Metal Craft Co., Grimsby, Ont.
Storage Bins and Cases, Walker Bin & Fixture Co., Kitchener.
Stone, Cleveland Stone Co., Cleveland, Ohio.
Sterilizers, Hospital Supply Co., and Am. Sterilizer Co., New York.
Structural Iron, Hamilton Bridge Co., Hamilton.
Tile, Kent Garvin Co., Hamilton.
Telephone System, Stromberg-Carlson Co., Toronto, and Signal Systems, Ltd., Toronto.
Vacuum Cleaners, United Electric Co., Toronto.
Ventilators, Sheldons' Ltd., Galt.
Varnish, Adams & Elting Co., Toronto.
General Contractors, Frid Construction Co., Hamilton.

Mountain Sanatorium, Hamilton.

Brick, Stock, W. H. Cooper, Hamilton.
Brick, Face, Don Valley Brick Works, Toronto.
Boilers, Spencer Heater Co., Toronto.
Beds, Ideal Bedding Co., Toronto.
Casements, Trussed Concrete Steel Co., Walkerville.
Cement, Canada Cement Co.
Concrete Hardener, Master Builders Co., Cleveland.
Door Frames, Metal, A. B. Ormsby Co., Toronto.
Enamel, Pratt & Lambert, Bridgeburg.
Electric Equipment, Cully & Brey, Hamilton.
Elevators, Otis-Fensom Elevator Co., Toronto.
Expanded Metal, Trussed Concrete Steel Co., Walkerville.
Flooring, Concrete, Frid Construction Co., Hamilton.
Flooring, Terrazzo, Kent Garvin Co., Hamilton.
Glass, Toronto Plate Glass Co.
Hardware, Belleville Hardware & Lock Co., Belleville.
Hardware (Jobber), Kent Garvin Co., Hamilton.
Hollow Tile, National Fireproofing & Sun Brick Co., Toronto.
Kitchen Equipment, Gurney Foundry Co., Toronto, and Brantford Oven & Rack Co., Brantford.
Lockers, Dennis Wire & Iron Works Co., London.
Marble, Vermont Marble Co., Peterboro.
Nurses' Call System, Bryant Electric Co., Bridgeport, Conn., and Northern Electric Co., Montreal.
Ornamental Iron, Canada Wire & Iron Goods Co., Hamilton.
Paints, Brandram-Henderson Co., Montreal.
Painting Contractors, Smith & Omand, Hamilton.
Pumps, Smart-Turner Co., Hamilton.
Plaster, Hill Bros., Hamilton.
Refrigeration Machinery, Canadian Ice Machine Co., Toronto.
Reinforcement, Trussed Concrete Steel Co., Walkerville.
Sash Cord, Hercules Brand.
Screens, Watson, Ltd., Bradford, Ont.
Steel Furniture, Metal Craft Co., Grimsby, Ont.
Storage Bins and Cases, Walker Bin and Fixture Co., Kitchener.
Sterilizers, King-Sherrer Co., New York.
Tile, Kent, Garvin Co., Hamilton.
Ventilators, Sheldons, Ltd., Galt.
Varnish, International Varnish Co.
Mason Contractor, W. H. Cooper, Hamilton.

St. Joseph's Hospital, Hamilton.

Brick, Geo. Frid Brick Co.
Beds, Ideal Bedding Co., Toronto.
Casements, Trussed Concrete Steel Co., Walkerville.

Barrett Specification Roofs

Made in Canada

Long Service at Low Cost—

MANY buildings have just "roofs." The contractor says, "I'll build you a pitch-and-felt roof," and he does so.

It may be a *good* roof or it may be a *poor* one, yet a pitch-and-felt roof is the best and most economical roof for any building, *provided it is built right.*

There is one sure way to eliminate all guess-work and chance—incorporate The Barrett Specification in full in your building plans and employ a responsible roofing contractor to do the work.

The result will be a roof which will give satisfactory service for twenty years and upwards. The unit cost (the cost per square foot per year of service) of a Barrett Specification Roof is lower than that of any other permanent roofing. No other roof covering known can even approximate this figure.

Remember that a Barrett Specification Roof is not a ready-made roofing. It is constructed on the building and is recognized as *standard* by technical men generally.

These roofs take the base rate of fire insurance.

Our 20-Year Guaranty Bond

We are now prepared to give *without charge* a twenty-year surety Bond Guaranty on every Barrett Specification Roof of fifty squares and over in all towns of 25,000 population and more, and *in smaller places where our Inspection Service is available.*

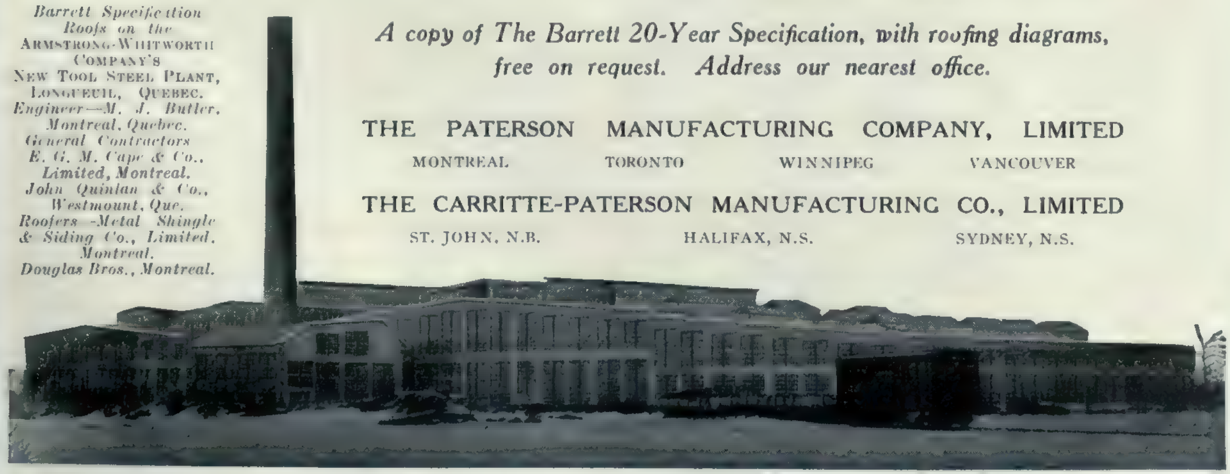
Our only requirements are that the roofing contractor shall be approved by us, and that The Barrett Specification, dated May 1, 1916, shall be strictly followed.

Write to our nearest office if you wish any further information regarding this Guaranty.

A copy of The Barrett 20-Year Specification, with roofing diagrams, free on request. Address our nearest office.

THE PATERSON MANUFACTURING COMPANY, LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER

THE CARRITTE-PATERSON MANUFACTURING CO., LIMITED
ST. JOHN, N.B. HALIFAX, N.S. SYDNEY, N.S.



Barrett Specification Roofs on the
ARMSTRONG-WHITWORTH COMPANY'S NEW TOOL STEEL PLANT, LONGUEUIL, QUEBEC.
Engineer—M. J. Butler, Montreal, Quebec.
General Contractors E. G. M. Cape & Co., Limited, Montreal.
John Quinlan & Co., Westmount, Que.
Roofers -Metal Shingle & Siding Co., Limited, Montreal.
Douglas Bros., Montreal.

Cement, Union Cement Co., Owen Sound.
Concrete Hardener, Master Builders Co., Cleveland.
Electric Equipment, Cully & Brey, Hamilton.
Elevators, Otis-Fensom Elevator Co., Toronto.
Expanded Metal, Trussed Concrete Steel Co., Walkerville.
Flooring, Concrete, Frid Construction Co., Hamilton.
Flooring, Linoleum, T. Eaton Co., Toronto.
Flooring, Terrazzo, Kent, Garvin Co., Hamilton.
Hardware, Belleville Hardware & Lock Co., Belleville.
Hardware (Jobber), Kent, Garvin Co., Hamilton.
Hollow Tile, Sun Brick Co. and National Fireproofing Co., Toronto.
Hose Reels, Montgomery Faultless Hose Reel Co., Toronto.
Interior Woodwork, Frid Construction Co., Hamilton.
Kitchen Equipment, Gurney Foundry Co., Toronto.
Lockers, Canada Wire & Iron Goods Co., Hamilton.
Marble, Vermont Marble Co., Peterboro.
Nurses' Call System, Holtzer-Cabot Co., Boston, and Signal Systems, Ltd., Toronto.
Ornamental Iron, Dennis Wire & Iron Works Co.
Paints, Adams & Elting Co., Toronto.
Plumbing Fixtures, Imperial Products, Ltd., Toronto.
Refrigeration, John Hillock & Co., Toronto.
Reinforcement, Trussed Concrete Steel Co., Walkerville.
Roofing, Thos. Irvin Co., Hamilton.
Screens, Watson, Ltd., Bradford, Ont.
Steel Furniture, Metal Craft Co., Grimsby.
Sterilizers, King-Sherrer Co., New York.
Tile, Kent, Garvin Co., Hamilton.
Ventilators, Sheldons, Ltd., Galt.
Varnish, Adams & Elting Co., Toronto.
General Contractors, Frid Construction Co., Hamilton.

Weston Sanatorium, Weston.

Brick, Wm. Pears, Toronto.
Boilers, Gurney Foundry Co., Toronto.
Beds, Ideal Bedding Co., Toronto.
Concrete Contractor, A. C. Richmond.
Electric Fixtures, McDonald & Willson, Toronto.
Electric Equipment, Hudson Electrical Co., Toronto.
Elevators, Otis-Fensom Co., Toronto.
Fire Doors, W. E. Dillon Co., Toronto.
Fire Extinguishers, Purdy, Mansell Co.
Flooring, Terrazzo, Italian Mosaic & Marble Co., Toronto.
Hardware, Belleville Hardware & Lock Co., Belleville.
Hardware (Jobber), Aikenhead Hardware, Ltd., Toronto.
Heat Regulators, Purdy, Mansell Co., Toronto.
Interior Woodwork, Walker & Robertson, Toronto.
Kitchen Equipment, Moffatt Stove Co., Weston.
Mason Contractor, Teagle & Son, Toronto.
Plumbing Fixtures, Standard Ideal Co., Toronto, and H. Mueller Mfg. Co., Sarnia.
Plaster, Andrew Petrie Co., Toronto.
Refrigeration Machinery, Canadian Ice Machine Co., Toronto.
Radiators, Gurney Foundry Co., Toronto.
Screens, Watson Ltd., Bradford.
Steel Furniture, Metal Craft Co., Grimsby.
Stone, Artificial, Toronto Ornamental Stone Co.
Structural Iron, Reid & Brown, Ltd., Toronto.

BUILDING PERMITS.

Total value of permits issued at Vancouver for the month of May, 1917, was $47,975, against that of $32,980 for the same month last year, showing an increase of $14,995.

CANADIAN FIRM SECURED CONTRACT.

The elevator contract for the W. C. Kennedy service building at Windsor, Ont., has been awarded to the Otis-Fensom Elevator Co., and not to the Houghton Elevator Co., Detroit, as stated in our May issue.

PERSONAL.

Edward Holgate, who has been chief draftsman with the Structural Steel Company of Montreal for the past seven years, has accepted a position as chief engineer with MacKinnon, Holmes & Company, Limited, of Sherbrooke, Que.

PROTECTING HOSPITALS FROM FIRE.

In the Ross Memorial and St. Joseph's Hospitals, described in this issue, and in many other public, office and factory buildings recently erected in Canada, the Montgomery Faultless Hose Reel has been installed. This reel is so simple in its operation that a nurse can use it. The reel is so built that the water can be turned on without unwinding the hose, as the staves supporting the hose collapse, allowing of its expansion. Only sufficient hose is unwound to carry the water to the blaze, and the hose, being wound, and not folded, lasts, by actual test, five times as long, besides eliminating the danger of having the hose break at the kinks when the water is turned on.

NEW MAUSOLEUM AT TORONTO.

Building operations upon the new Mount Pleasant Cemetery Mausoleum, Toronto, which will be the second largest in America, are now under way, and it is expected that the work will be well nigh completed before summer is over. The structure will cost some $350,000. The exterior will be of solid granite, and the interior of granite and marble. There will be 1,100 crypts and 24 private rooms with from ten to twelve crypts each. A beautiful chapel will be situated immediately within the entrance doors. The mausoleum will be 225 feet long and 125 feet in width, and second only in size to the Chicago Mausoleum. It was designed by Frank Darling, Toronto, and is in the Doric style of architecture. The lighting of the interior consists of an arrangement of ten large stained glass windows.

VENTILATION EQUIPMENT FOR HOSPITALS.

In view of the many hospitals being erected or under contemplation in all parts of Canada, and that many buildings erected for other purposes are being remodelled into temporary hospitals, it is desirable that the ventilation needs of hospital buildings be emphasized.

Wounded and disabled soldiers, and any persons who find it necessary to receive hospital treatment, require fresh air as one of the first essentials to an early recovery. While hospital boards are too frequently hampered by lack of sufficient appropriation for purchase of equipment, the inclusion of proper ventilation apparatus is one of the most important items to be specified in a hospital building.

The modern practice with regard to ventilation for hospitals is to supply a constant volume of fresh air which has previously been washed and filtered into the operating suites, private wards, semi-private wards and public wards, each suite of wards being handled independently, and this supply of air is then exhausted from the kitchens, lavatories, service rooms and etherizing rooms.

The three large hospitals recently erected in Hamilton and featured in this issue, are equipped with Sheldon ventilating appliances throughout, similar to that installed in the Toronto General Hospital, Wellesley Hospital, St. Michael's Hospital, Weston Sanitarium, Toronto, and many other hospital buildings throughout Canada.

ESTABLISHES CANADIAN PLANT.

Canadian purchasers of steel products will be interested to learn that the Pittsburgh-Des Moines Steel Company, formerly known as the Des Moines Bridge & Iron Company, with works at Pittsburgh, Pa., and Des Moines, Iowa, has recently established a plant at Chatham, Ont. This Canadian branch of the company, known as the Canadian Des Moines Steel Company, Limited, has purchased the property of the Chatham Bridge Company, Limited, and has enlarged and completely equipped this plant to handle the manufacture of all standard types of steel structures, including mill buildings, office buildings, fire escapes and bridges. In addition to this they will also make a specialty here, as in the States, of the manufacture and erection of elevated steel tanks and other special structures, such as standpipes, storage tanks, smoke stacks, barges and coaling stations. In future all sales in the Canadian territory will be handled from Chatham, and all steel for delivery in Canada will be fabricated at this point.

DEVELOPING QUARRY PLANT NEAR WINDSOR.

Extensive developments are being made by the Brunner Mond, Canada, Limited, Amherstburg, Ontario, at the Amherstburg quarry, which they control. Several new buildings are being erected and several old ones altered.

The excavation for the main part of the plant has been completed, and the foundation for the machine shop is under way, while the subway to the boiler house is partly completed. The machinery at the quarry will be tried out, the crusher tested, and work of getting stone out for the concrete will be proceeded with at once. Cement, gravel and steel necessary are also on hand, and the railway from the quarry to the site of the plant has been laid. A residence has been converted into an office building, and another one into a first aid hospital. Houses around the quarry have been fitted up for employees.

Stone from this quarry is said to have gone into the first U. S. ship canal at the American Soo, and it is known that all the stone for the Canadian lock at the Soo came from here.

The property has been operated by different persons for many years, but the present development is on a more extensive scale than before attempted. Mr. Rutherford is general manager.

CATALOGUES and BOOKLETS

How to Know Good Lighting.—A very interesting booklet on indirect lighting has been issued by the National X-Ray Reflector Company, Chicago, illustrating numerous views of office interiors, banks, hotels, stores, clubs, churches, hospitals, schools, libraries and public buildings, many in Canadian cities in which the indirect system is used. The booklet is of interest to any architect having an interior lighting problem to consider.

New Corr-Mesh Catalogue.—The Corrugated Bar Company, of Buffalo, N.Y., reinforced concrete specialists and distributors of Corr-Products, has just issued a very attractive and useful catalog on Corr-Mesh. Corr-Mesh is a stiff-ribbed diamond mesh expanded metal employed on reinforced concrete, plaster and general stucco work. Two kinds are manufactured, one having ribs ¾-inch high, and the other having ribs 5-16-inch high. The forepart of the catalog is given over to a detailed description of the material, its advantages and various applications. The pages following are devoted to designing tables, graphical construction details and specifications relating to the use of Corr-Mesh in partitions, exterior walls, floors, roofs and ceilings respectively. Construction photographs showing the method of handling and erecting the material, and, incidentally, its wide and universal application, are scattered throughout the catalog in pleasing effect. The catalog contains much data which is valuable to the architect, engineer and contractor, and copies may be procured by addressing the Corrugated Bar Company, Mutual Life Building, Buffalo, N.Y.

ROOFING

THE roofing of the Ross Memorial Hospital featured in this issue is one of a number of outstanding buildings recently completed by us.

We are thoroughly equipped to handle any roofing contract.

Estimates
Furnished
for all
Roofing
Requirements.

Geo. W. Reed & Co., Limited
MONTREAL - CANADA

CONSTRUCTION

July, 1917 Vol. 10, No. 7

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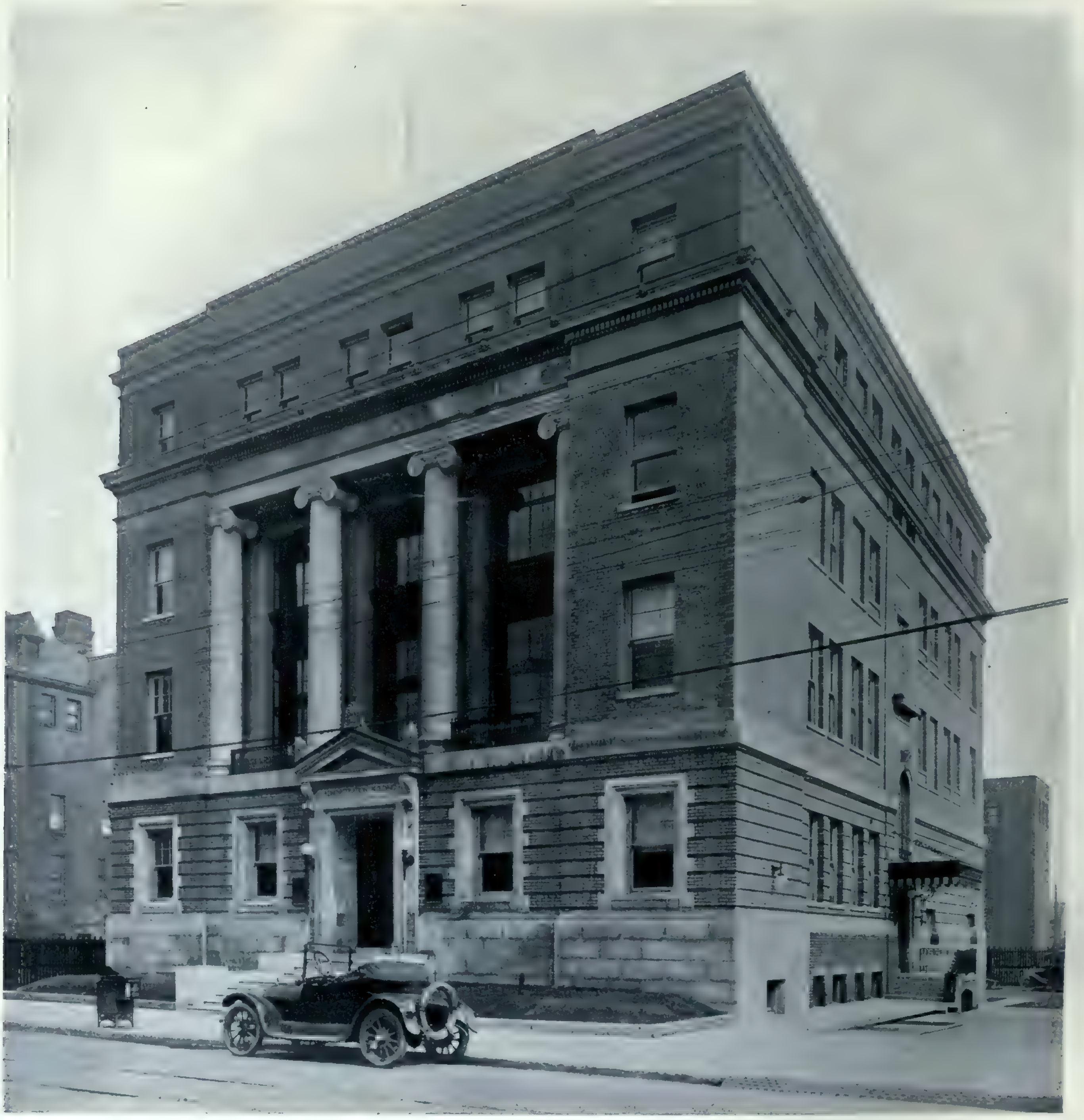
BOARD OF EDUCATION ADMINISTRATION BUILDING, TORONTO 222

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



BOARD OF EDUCATION ADMINISTRATION BUILDING, TORONTO.

Board of Education Administration Building

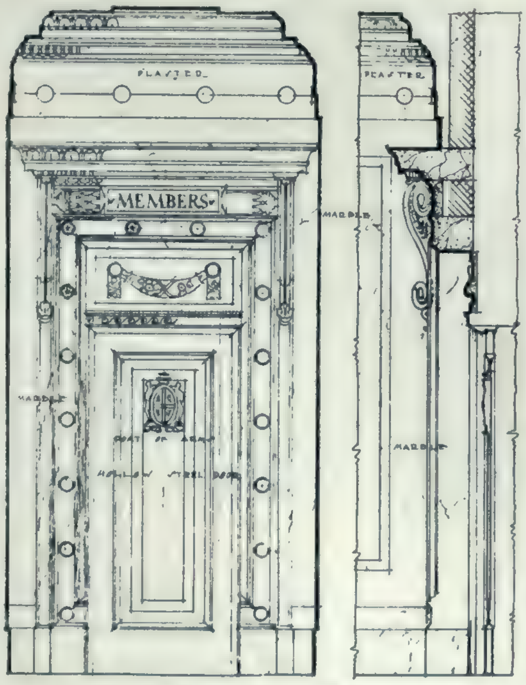
Where Toronto School Officials and School Building Department Have Their Headquarters

A FINE, new administration building of the Board of Education contains the board room, members' room, committee rooms and the administrative offices of the board such as the secretary-treasurer's, school inspectors', superintendent of supplies' and superintendent of buildings.

Temporary offices were at one time at the corner of Wellington and Church streets, later at the corner of Richmond and York streets, in the York Street School, and later in the City Hall, during which time the board found it necessary to use the City Council chamber for a board room.

The building is sixty-seven feet across the front, ninety-one feet in depth, and is four stories above the basement.

The basement floor contains the caretakers' quarters, lunch rooms for the staff, store rooms and heating apparatus. The ground floor opens out into College street, also at the side to a driveway, and contains offices for the supply department, offices for the medical inspection department, a special members' room, the board room, the telephone central, and, in the main hall, the general inquiry wicket. The second floor contains two committee rooms, and offices for the secretary-treasurer. The third floor contains a private office for the chief inspector, library, a private office for special supervisors, a filing room for the buildings' department, and a tendering room for contractors to view plans and specifications. The fourth floor contains a private office for the superintendent of buildings, and general offices for his staff, including a specially designed draughting room for preparing plans and specifications, etc. The ceiling of this room is extra high; lighting is from three sides, and from the top by a large skylight, with a cheerful southerly exposure. The facilities of the room are excellent, being equipped with the most modern draughting tables and filing cabinets.



DETAIL OF DOOR TO MEMBERS' ROOM.

MAIN ENTRANCE HALL AND ELEVATOR.

The type of general construction is steel skeleton and what is termed as first-class fireproof construction. The floors, roof, columns, coverings and partitions are terra cotta, the exterior being enclosed with brick curtain walls supported by the steel frame. As the building was erected over the old "Sleepy Hollow Creek," it was necessary to carry the columns down a considerable depth, and use independent reinforced concrete spread footings.

The heating throughout is by direct steam; and in addition to this the members' private room, the board room, and the two committee rooms, have a special warm air blast system to supply fresh air.

An electric elevator accommodates all floors, including the basement and roof, and a hand hoist is fitted up in the basement for removing ashes. The lighting is electric, through semi-indirect fixtures. Vault, toilet room, etc., accommodation for the different departments is provided for on their respective floors.

The design is of pure Greek Ionic architecture, as nearly as could be adapted to a modern office building; the choice of grey brick and grey stone adds much to its beauty. This adds one more interesting building to College street.

The feature of the main facade is an Ionic portico surmounting a heavy rusticated base, which is the ground floor story; this story is flanked by two end pavilions, the whole supporting an attic story. The spandrils between the stone columns are made up of ornamental iron windows. The main entrance is a splendid modern adaption of the famous Greek Erechetheion Temple doorway. The general treatment of the interior is very plain except the main entrance hall, the members' room and the board room. The members' room is approached through an ornamental doorway off the main hall near the information bureau, and provides a comfortable meeting place for the members. The walls are fitted with lockers and telephone booth in the panelling which incases all walls. The ceiling is very attractive with false beams. On the south side is a stone and brick fireplace between two windows.

DRAUGHTING ROOM IN ADMINISTRATION BUILDING.

The board room has three entrances one from the members' room one from the main hall, and one from the stair landing into a small gallery. The balcony is constructed without columns, to avoid any obstruction below. The chairman's dais is of Greek design, in harmony with the building. The walls and ceilings are decorated in Renaissance design, with ornamental plaster. The whole of the woodwork, and the chairs, desks, tables, etc., are all of genuine black walnut, richly upholstered in black leather.

The main hall has a simple plaster wall treatment, relieved by antae-pilasters supporting an entablature and plaster panelled ceiling. In the centre of the building, on the main floor hallway, is a plain but beautiful mahogany enquiry bureau, where one can be put in touch, or can communicate with, any department in the building.

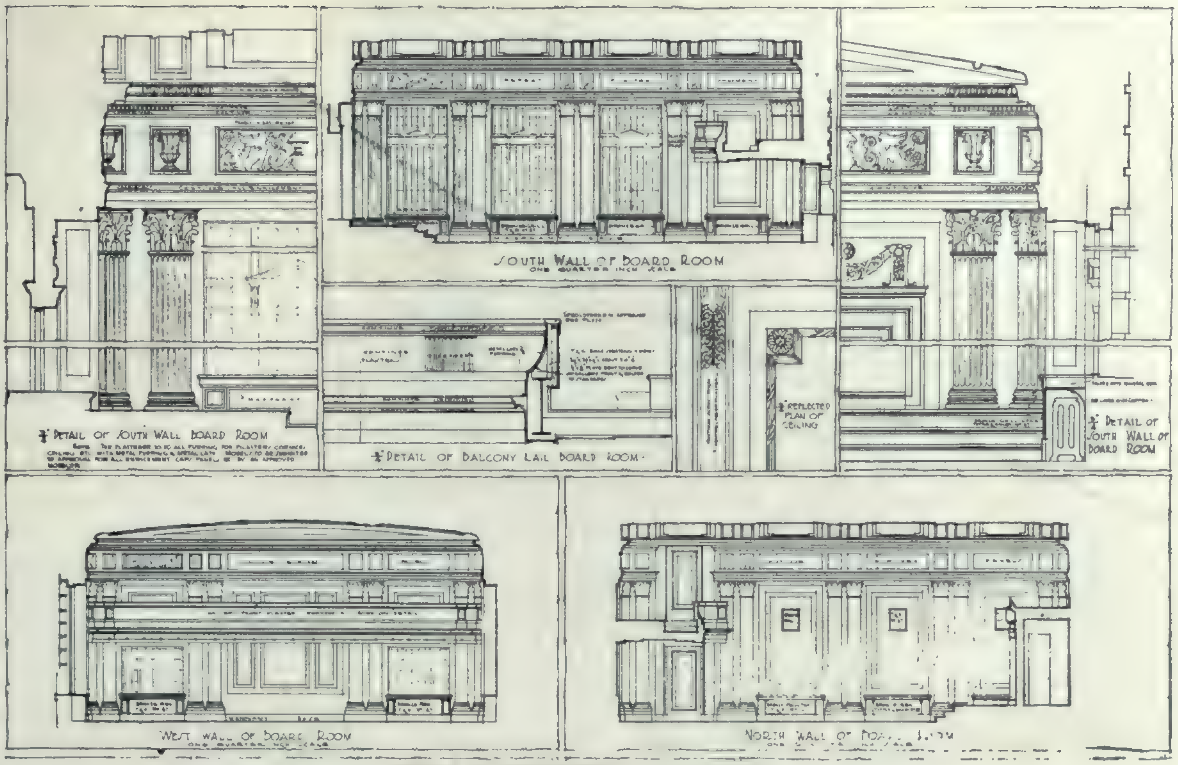
◆

ORNATE AND ARTISTIC

A curious misconception is abroad concerning art in school architecture. Many school board members are apparently of the opinion that a building which is not well supplied with decorative detail is inartistic. The same opinion seems to prevail among certain architects. The "School Board Journal" tells of a man who complained bitterly of the lack of appreciation for good architecture on the part of a building committee which had just rejected his rather elaborate design in favor of a simpler and plainer plan. He had provided for expensive cut stone cornices and belt courses on the facade, elaborate marble wainscoting and stucco trim in the corridors and assembly room and other embellishments. While his general plan was good, such important details as relation of stairways to corridors and classrooms, arrangement of toilet rooms, etc., had not been fully studied. His competi-

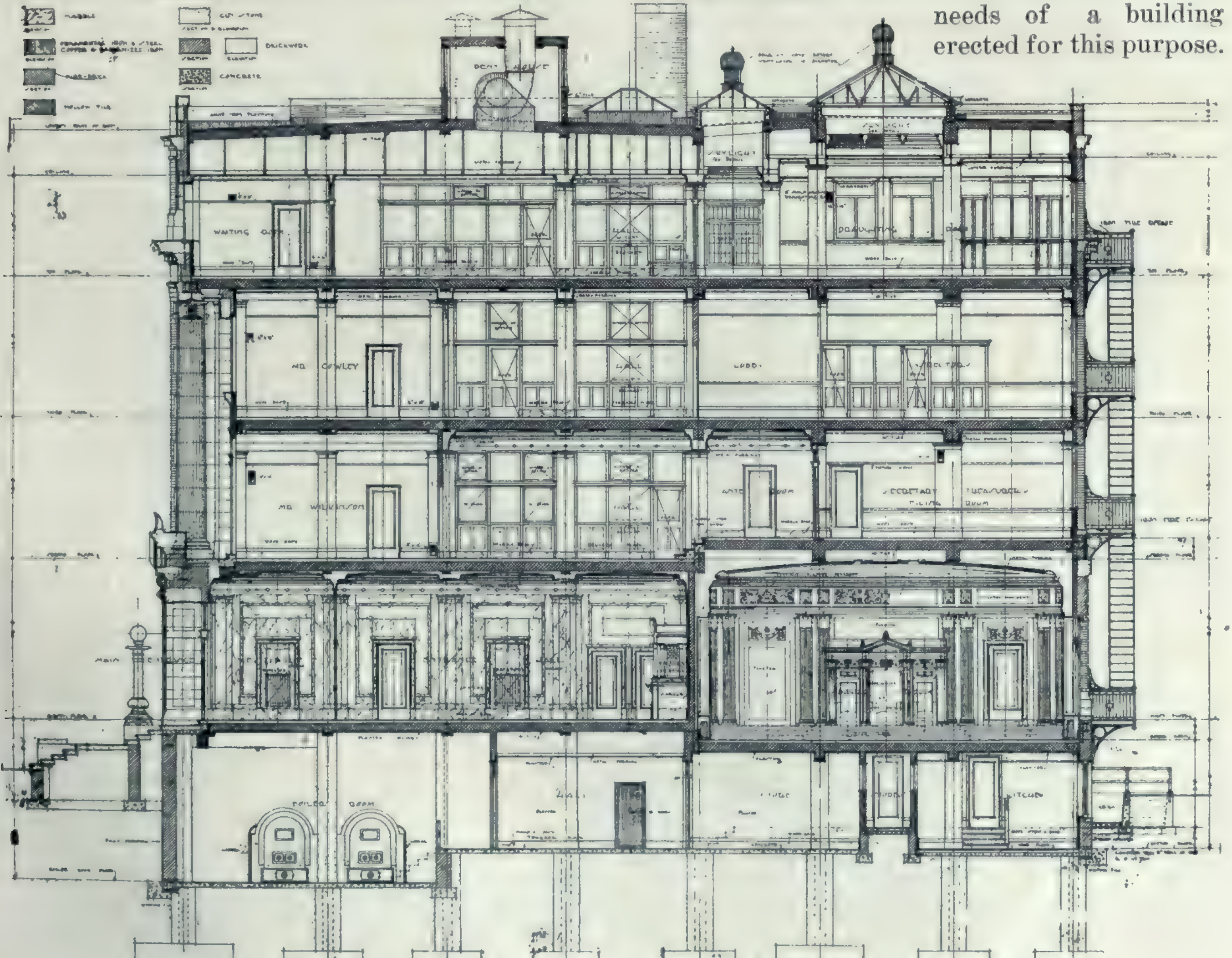
TORONTO BOARD OF EDUCATION MEETING ROOM.

tor, whose plans were rather plain, had, on the other hand, studied very carefully every feature of his building and had completed a general design which depended upon good proportions and well-chosen materials for its effect.

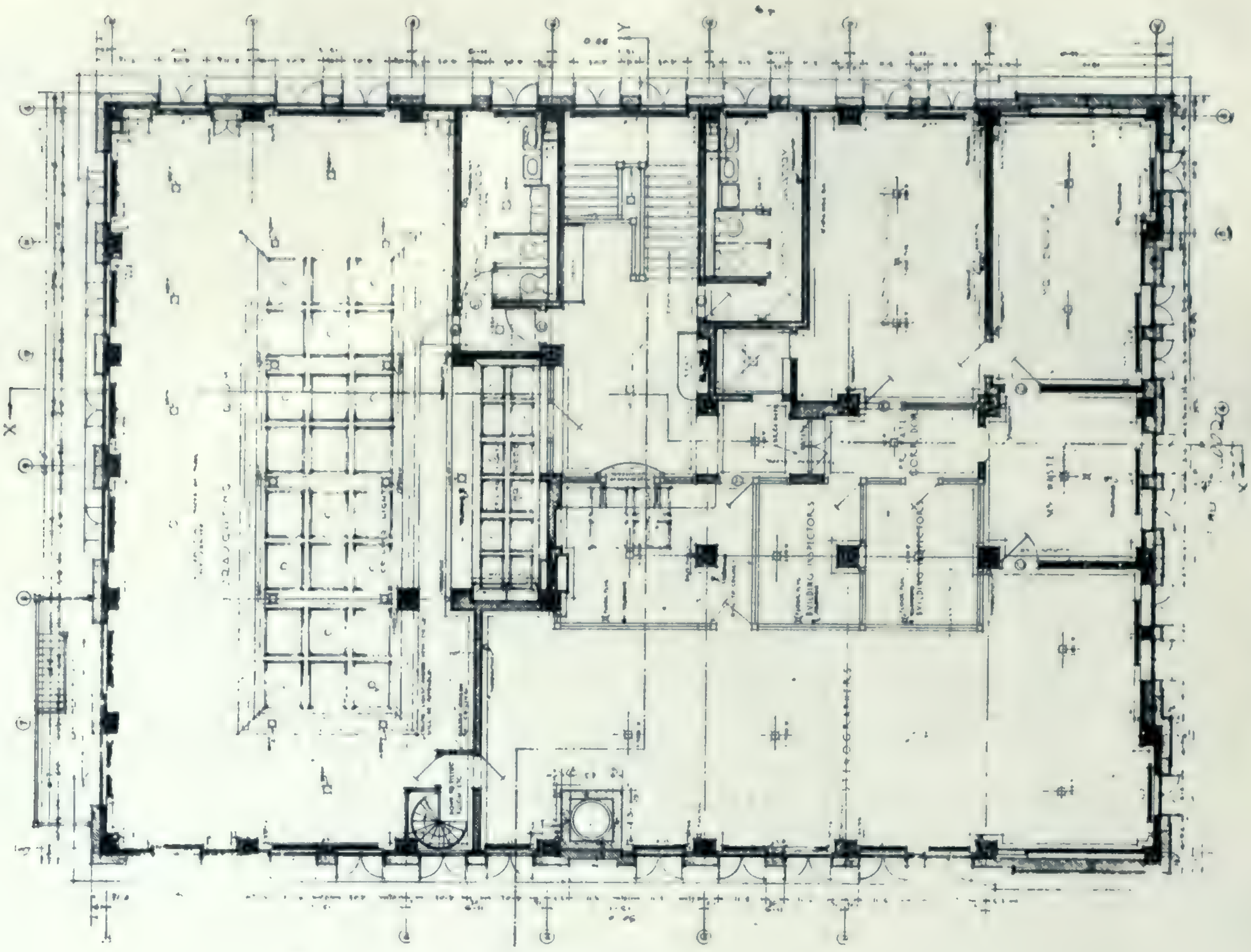

SOUTH WALL OF BOARD ROOM
ONE QUARTER INCH SCALE
DETAIL OF SOUTH WALL BOARD ROOM
DETAIL OF BALCONY RAIL BOARD ROOM
REFLECTED PLAN OF CEILING
DETAIL OF SOUTH WALL OF BOARD ROOM
WEST WALL OF BOARD ROOM
ONE QUARTER INCH SCALE
NORTH WALL OF BOARD ROOM

DETAILS OF TREATMENT OF BOARD ROOM.

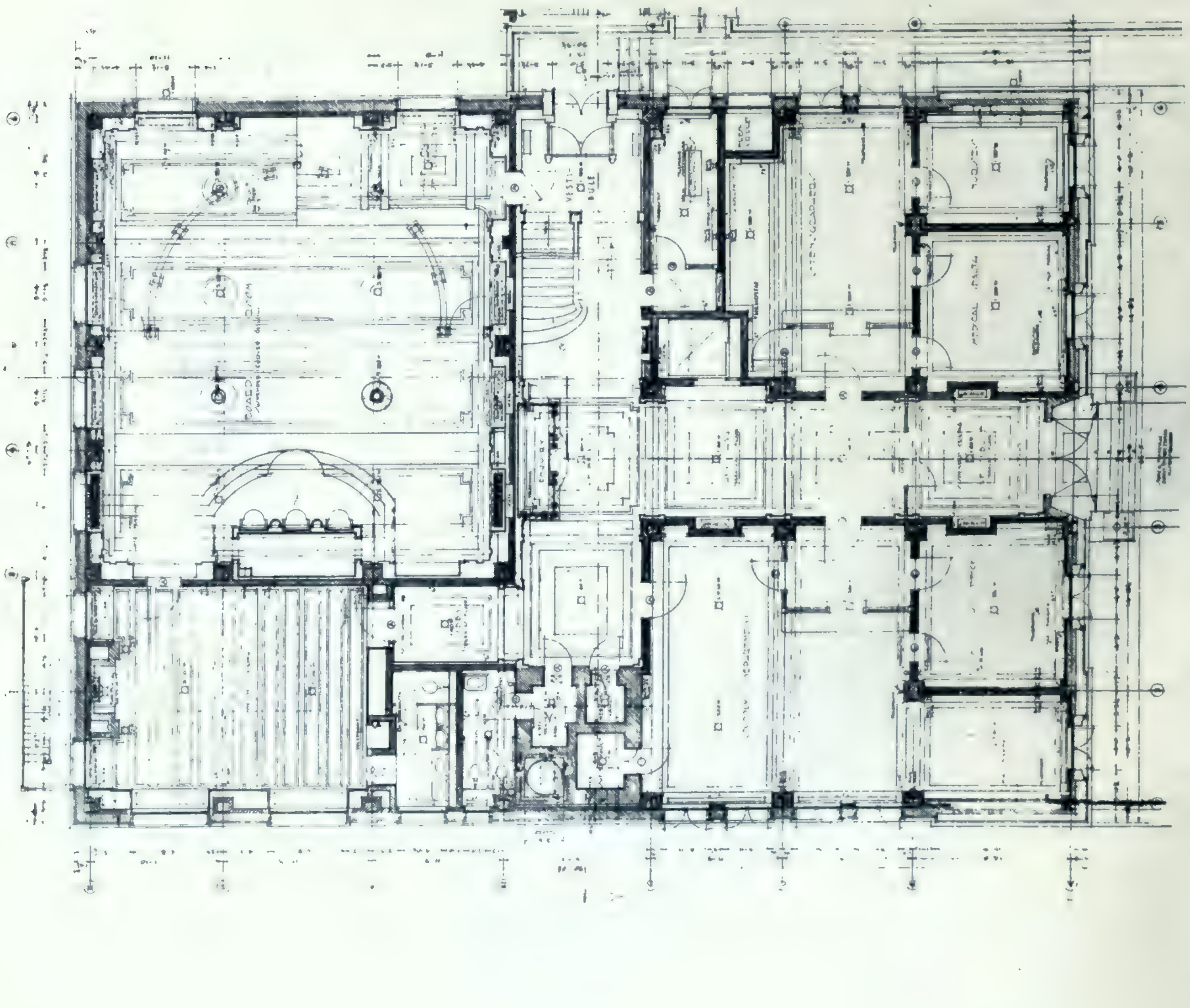
The highest art in architecture, whether it applies to school buildings, office buildings or homes, involves a blending of the beautiful with the useful, in which no essential of the whole is disregarded. Good architecture in schoolhouses means attention to all the possible educational needs of a building erected for this purpose.



SECTIONAL VIEW FROM WEST SIDE OF ADMINISTRATION BUILDING.



FOURTH FLOOR PLAN OF ADMINISTRATION BUILDING.



GROUND FLOOR PLAN OF ADMINISTRATION BUILDING.

New Commercial High School at Toronto

Accommodates Eight Hundred Pupils and Gives a Combined High School and Commercial Education

THE High School of Commerce and Finance, recently erected by the advisory commercial committee of the Toronto Board of Education, is of the solid block type, a large assembly room being placed in the centre of the building, with spacious corridors at the sides. The class rooms are arranged along the outside walls, which allows for excellent non-obstructed lighting for class work. The assembly room, which has a seating capacity of one thousand, is one of the present high school essentials. It is used for special lectures, concerts, and opening and closing exercises, etc.

The assembly room and corridors are first-class fireproof construction, finished with terrazzo floors.

The rotunda on the main floor, with its panelled oak columns and iron staircases, gives an impression in keeping with the size and importance of the building.

The building is heated throughout with direct steam radiation, and, in addition to this, the class rooms and assembly room are ventilated with warm air fan blasts.

The lighting of class rooms is by large group windows, on one side only, to the left of pupils, in accordance with well-established practice in school building.

The principals' office is directly connected with the class rooms by telephones, also class bells. Fire alarm bells are provided throughout the corridors.

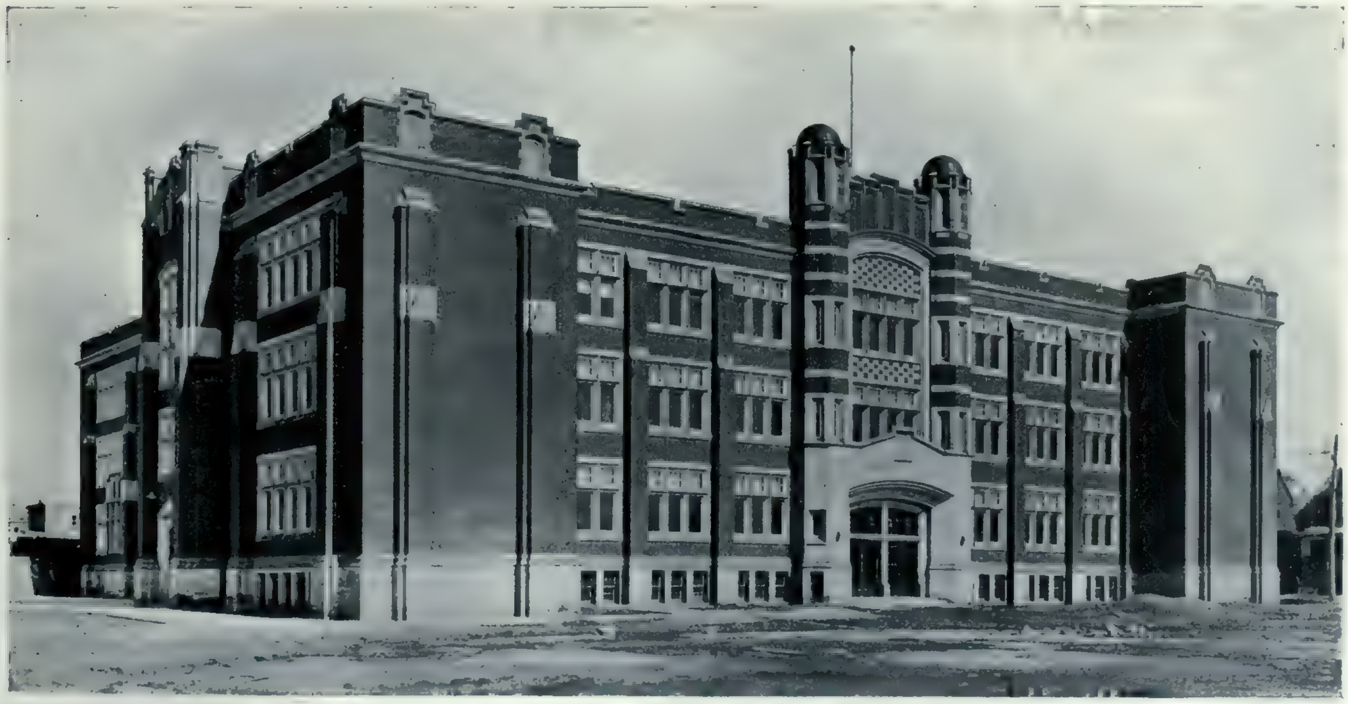
The following accommodation is provided: twenty-one class rooms, one business practice room, one business practice office, two typewriting rooms, two study of material laboratories, two lecture rooms, one commercial art room, one commercial museum, two emergency rooms, one library and reading room, and an auditorium capable of seating one thousand persons.

The basement, which is well above ground, contains assembling rooms, recreation rooms, bicycle rooms and toilet rooms—on the west side for the boys, and on the east side for the girls; there is also a students' supply room and a large cafeteria, located centrally between the boys' and girls' quarters, and thus readily accessible to both.

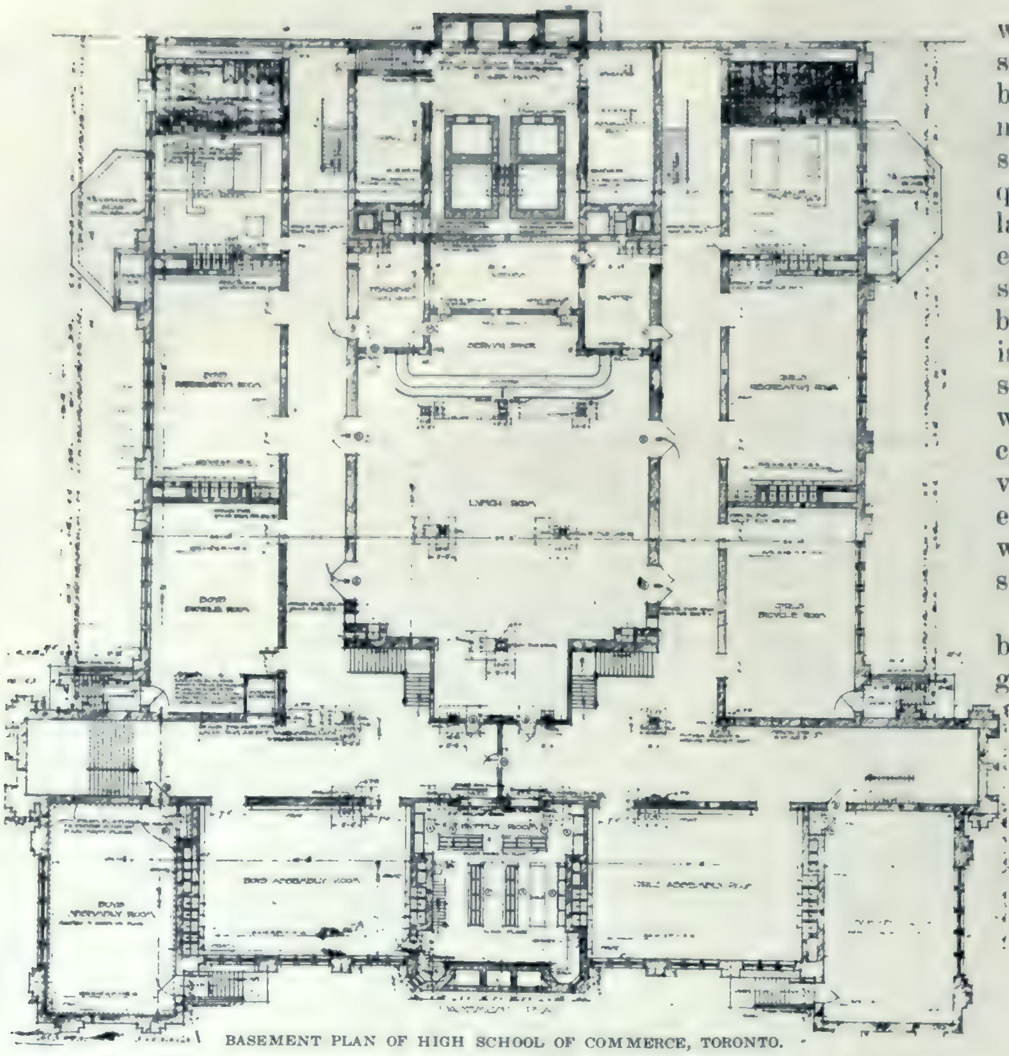
The ground floor contains the main floor of the assembly room, seven class rooms, a typewriting room, the library and teachers' room, the first floor contains the balcony of the assembly room, six class rooms, a senior laboratory, a preparation room, a small lecture room, a commercial museum, a business office, a typewriting room, and toilet rooms. The second floor contains eight class rooms, a junior laboratory, a preparation room, a small lecture room, an art room and toilet rooms.

The design is an adaptation of Gothic. The building is faced with selected red stock brick, having special recessed joints, and trimmed with white stone. The building cost $300,000.

The school accommodates eight hundred



FRONT ELEVATION OF CENTRAL HIGH SCHOOL OF COMMERCE, TORONTO.



BASEMENT PLAN OF HIGH SCHOOL OF COMMERCE, TORONTO.

pupils, and the equipment, though not expensive, consists of the most modern appliances for demonstrating business methods and systems of accounting, and for presenting the various aspects of business life. The equipment includes special desks and filing cabinets for the business practice rooms; typewriters and typewriting desks; duplicating machines; adding machines and dictaphones.

The purpose of the school is to give a general high school education, together with such a training in business theory and practice that students, besides being generally well informed, will be able to adapt themselves to the needs of any business with which they may become identified. Besides inculcating such requisites as punctuality, regularity, faithfulness, courtesy and industry, and besides giving a knowledge of business routine, the purpose is to give such a training, such an outlook on life, as will develop prompt and accurate judgments—the cultivation of the intellectual equally with the mechanical, which is essential to leadership in the business world.

Particularly in the general business course are students given a knowledge of the facts of nature and of the economics of the world around them. With this broader outlook they are inspired with an ambition which will enable them to advance more rapidly to superior positions in the business world, and to more intelligently cope with the problems which will meet them in a business career. Thus, while the cultural side is not neglected, the aim is to make all the subjects serve the special vocational purpose for which this class of school exists, namely, a preparation for business.

It is not intended that these courses shall turn out thoroughly trained business men and women, but rather students so trained that they may readily adapt themselves to and master the details of any business with which they may become connected:

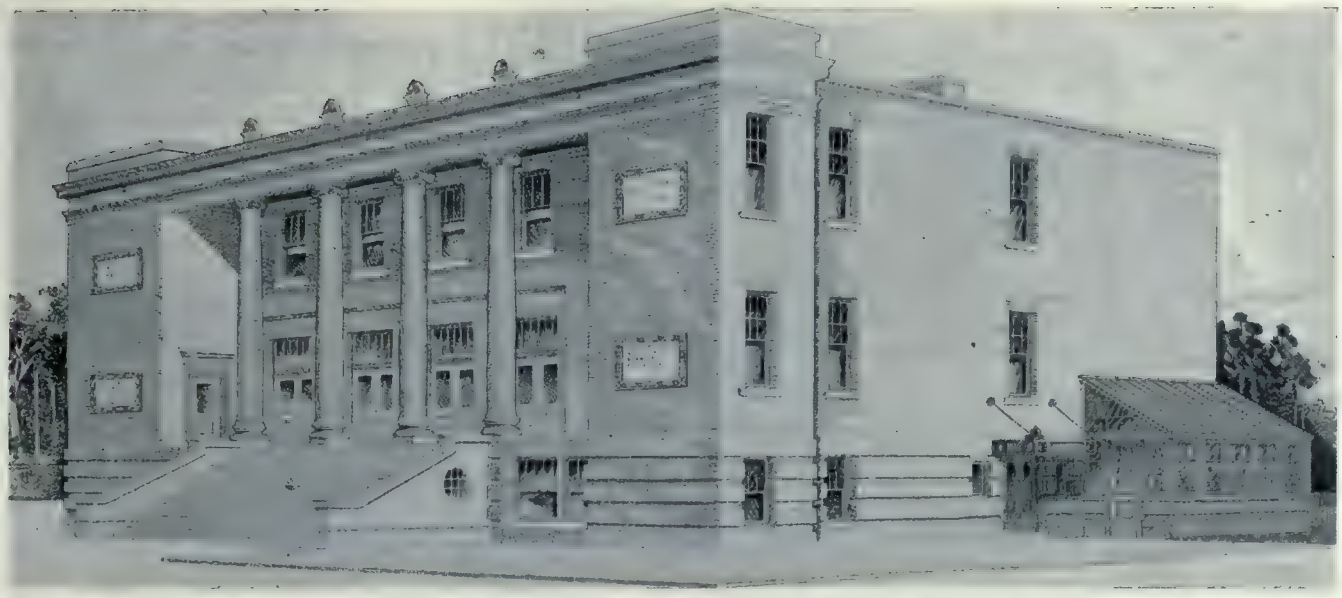
1—Accountancy Course.—This extends over three years, and is intended to fit students to become bookkeepers, accountants, etc.

2—Stenography Course.—This also extends over three years, and is intended to meet the needs of students looking forward to positions as stenographers, secretaries, etc.

3—Secretarial Course.—This is a broader course and extends over four years. It prepares students not only for stenography and general office work, but more particularly for the work of the private secretary.

4—Salesmanship Course.—This is also a broader course and extends over four years. Its purpose is to prepare students not only for general office work, but for positions that will eventually lead to salesmanship both in the warehouse and on the road.

AUDITORIUM IN HIGH SCHOOL OF COMMERCE, TORONTO.



BEAMSVILLE HIGH SCHOOL. W. W. LACHANCE, ARCHITECT.

A Well Equipped High School at Beamsville

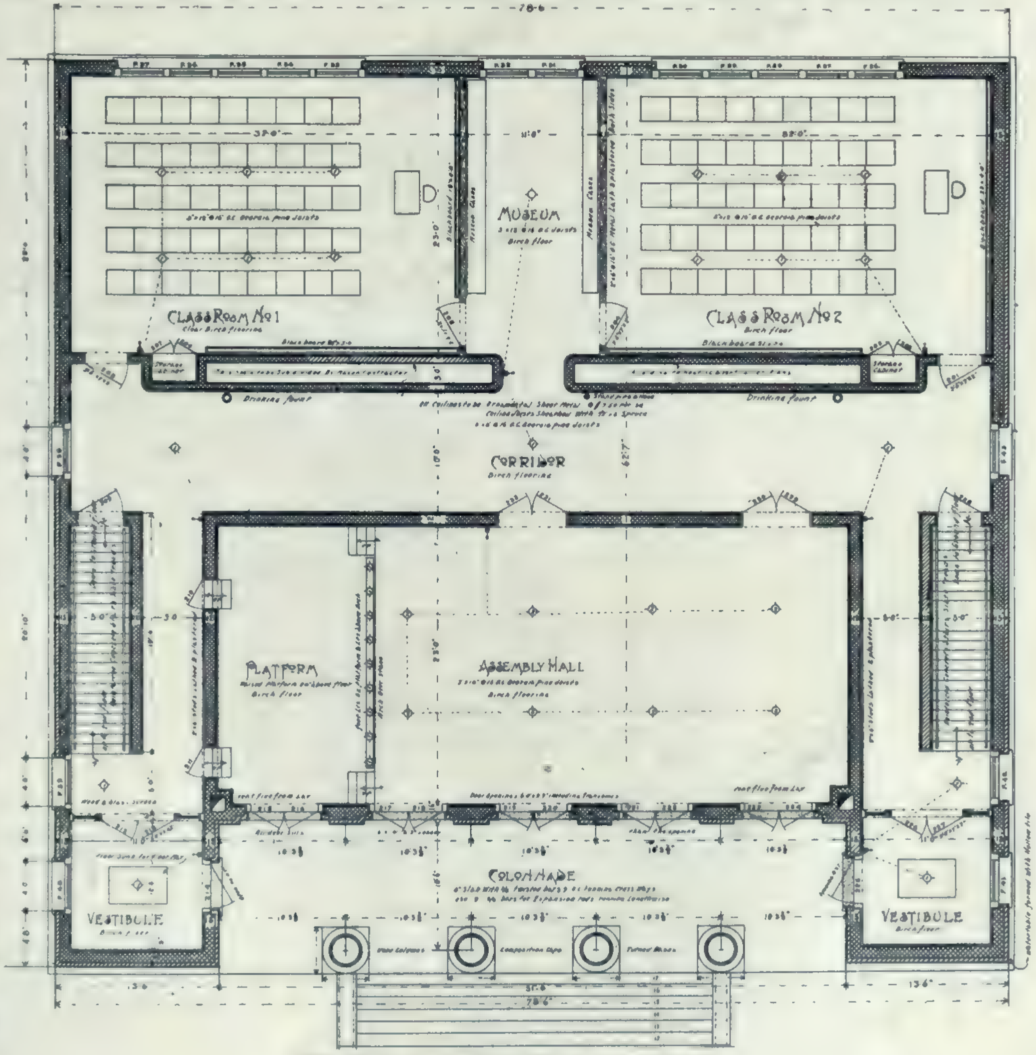
Basement Above Grade Line—Assembly Room on First Floor—Laboratories on Second Floor

By W. W. LaChance, Grimsby Beach, Ontario.

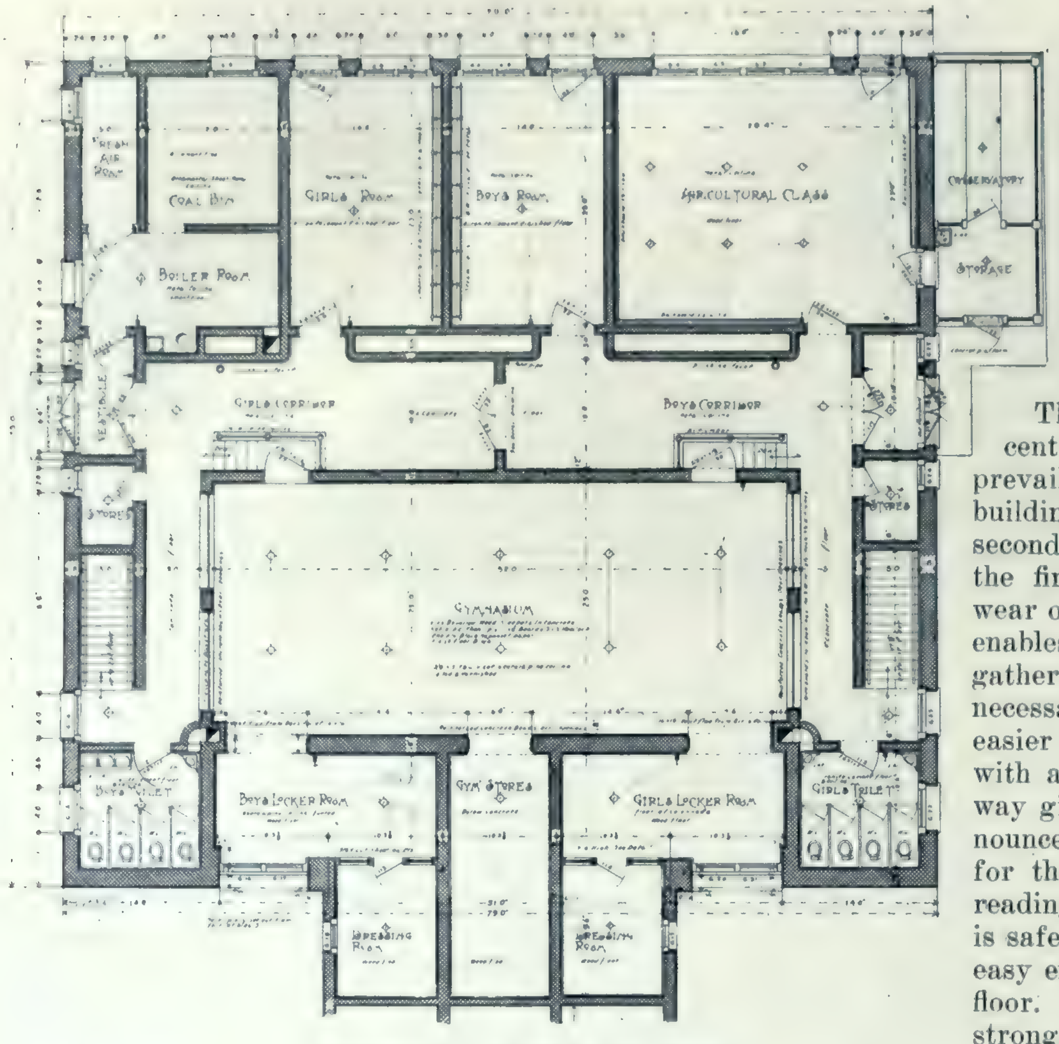
WHEN one begins to make plans for a high school building, certain definite and peculiar demands stare him in the face. He sees at once that every high school building ought, in addition to ordinary class rooms, to contain laboratories for the sciences, rooms for manual training, drawing, art, library, office, and especially an assembly hall. If he is more ambitious, he will try to include a room for cooking and serving lunches, bathrooms and gymnasium.

It is a fact that these latter demands are growing ones, and that in the near future they will take their place as rightful and helpful agencies in every well-equipped high school. At present, however, not every community can supply these, and it becomes necessary to offer some plans which will include only the bare necessities.

Recent construction of school buildings at various points give increased evidence that the school authorities, acting for and with the people, have foreseen and prepared for the enlarged utilization of public school facilities which will, in the future, be demanded by citizens and tax payers every-



FIRST FLOOR PLAN, BEAMSVILLE HIGH SCHOOL.

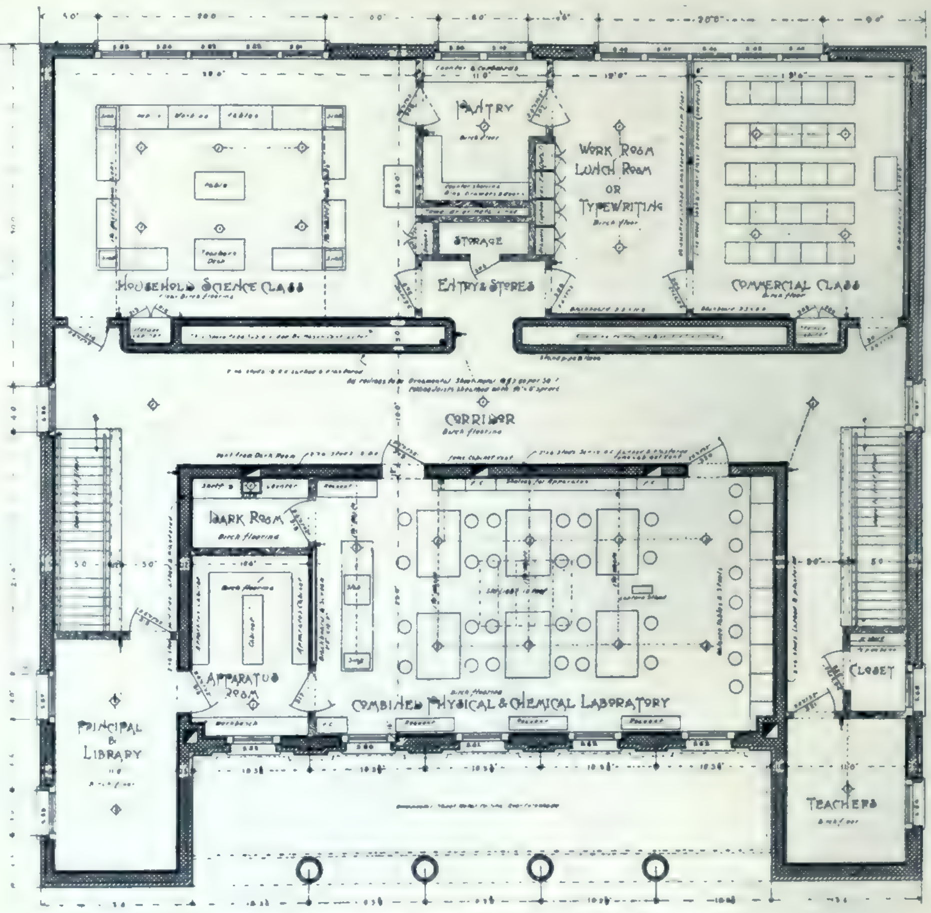


BASEMENT PLAN, BEAMSVILLE HIGH SCHOOL.

where. The new high school for Beamsville, Ont., will illustrate this tendency.

The usual basement has its floor four or five feet below the grade line, in this case it is eight inches above the grade line, thus giving abundance of light and easy access to the various rooms without the necessity of climbing stairs. On this floor level are located the boys' and girls' cloak rooms; these are provided with umbrella racks and gutters, and hat and coat hooks projecting six and twelve inches from face of wall, under which are placed steam coils protected with wire mesh guards; these coils not only heat the room, but dry the umbrellas and damp clothes of the pupils. The agricultural class is located on the ground level and has access to garden plot and conservatory. The gymnasium floor level is four feet below the grade level, thus giving a sixteen-foot ceiling. The corridors act as space for spectators. Off the gymnasium are dressing and locker rooms for both sexes. Ample storage room is provided under the colonnade floor. All walls are of hollow tile plastered with cement plaster waterproofed.

The assembly hall is in the centre of the school. The prevailing practice in older buildings was to put it on the second floor, but, if located on the first floor it saves much wear on the building, in that it enables large audiences to gather without climbing unnecessary stairs. It makes it easier to start the day's work with an assembly, and in this way gives opportunity for announcements by the principal, for the inspiration of song, readings, or short lectures. It is safer in case of fire, permits easy entrance from the second floor. It insures a safer and stronger building for large audiences. The stage is of ample proportions. The lighting is abundant,



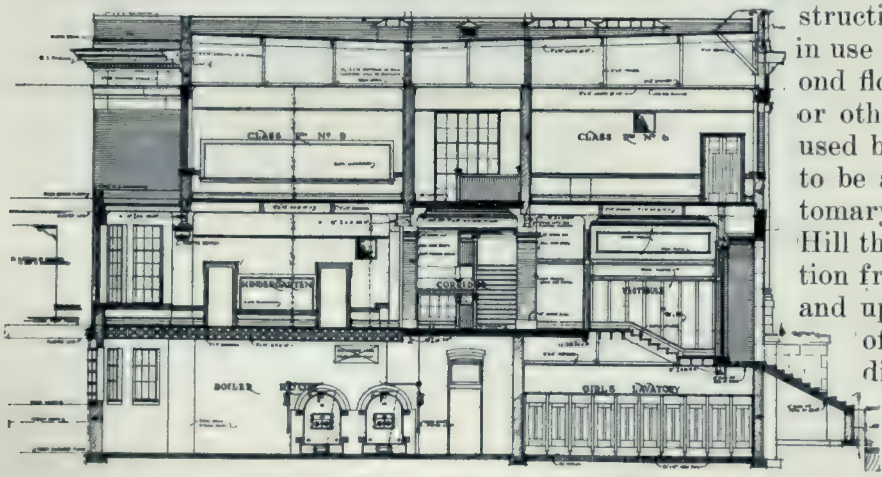
SECOND FLOOR PLAN, BEAMSVILLE HIGH SCHOOL.

and in summer time the large double doors opening on the colonnade may be thrown open. In village and country high schools there is as much or more need, comparatively speaking, for assembly halls, as in cities with more pretentious buildings.

The chemical and physical laboratories are combined in one room on the second floor.

All things considered, I am persuaded that physical and chemical laboratories are better placed on the second or top floor than on the first. Sky lighting can be obtained, better ventilation, and less danger of fumes reaching class rooms, less noise, are the main advantages. In a high school where one teacher is expected to teach both these sciences, one supply room of ample dimensions and of proper construction can be made to suffice, and by using a combined physical and chemical desk for the students, much room can be saved. The dark room is ventilated and equipped with plumbing. The walls below grade are of concrete and are waterproofed, the floors are under-drained, are of concrete, and made impervious to dampness. Walls above grade line rest on a damp course of waterproofed cement, and are composed of hollow tile, faced with red pressed brick laid in lime mortar.

The building contains two hundred and thirty-eight thousand seven hundred cubic feet, and cost $30,000, or 12½c. per cubic foot. The contracts were closed about the first of June last year. This is, in the writer's opinion, one of the most economical plans ever designed for a rural school.



SECTIONAL VIEW, BEAMSVILLE HIGH SCHOOL.

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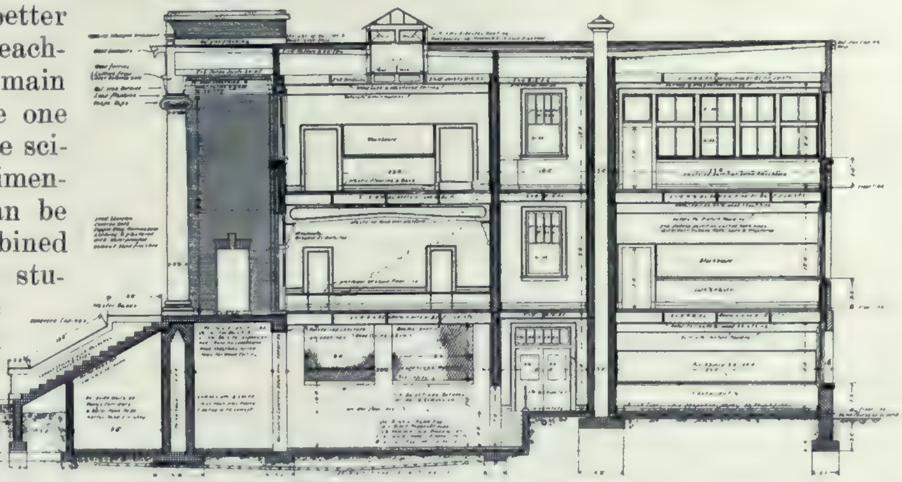
MANY HOSPITALS BEING BUILT

Present indications are that Canada's hospital accommodation will be more than doubled during the next year or two, the need largely resulting from the effects of the war in Europe.

The Canadian Military Hospital Commission is erecting a large number of hospital buildings to standard plans worked out to meet the needs for caring for mental, tubercular and surgical cases, these hospitals being located in every province of Canada.

The Provincial Governments and the Municipal Councils also recognize the increased need for hospital accommodation, and the desirability of selecting the best materials and most modern equipment.

The several hospitals illustrated in the June issue of CONSTRUCTION are excellent examples of the progress that is being made in hospital construction in Canada, and in the August issue the special type being erected by the Military Hospital Commission will be described.



SECTIONAL VIEW, BEAMSVILLE HIGH SCHOOL.

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HISTORY OF WINDOW DESIGN

In a recent address Dr. Vernon E. Hill reviewed the history of window design and construction, and showed that windows were in use in ancient Egypt, at least on the second floors of buildings, but without glass or other protection. That they were also used by the Greeks and Romans is known to be a fact. Instead of glass it was customary to use pieces of colored glass. Dr. Hill then took up modern window construction from the standpoints of first cost, care and upkeep, loss of wall space, admission of flies and other insects, admission of dirt, weakening of walls and injury to building, entrance for burglars, increase of heat waste, interference with mechanical ventilation, increased liability to fire and fire panic and nuisance from noise. Under the last heading he showed that in office buildings, in the congested districts of large cities, the noise from electric cars, passing trucks, etc., entirely prevents the use of windows for ventilation on the first, second or even third floors. This is also a serious objection in the cases of hospitals and schools. Dr. Hill spoke at length of the window requirements of factories and workshops, this part of the paper being accompanied by illustrations of typical designs.

New Eight Room Public School at Galt

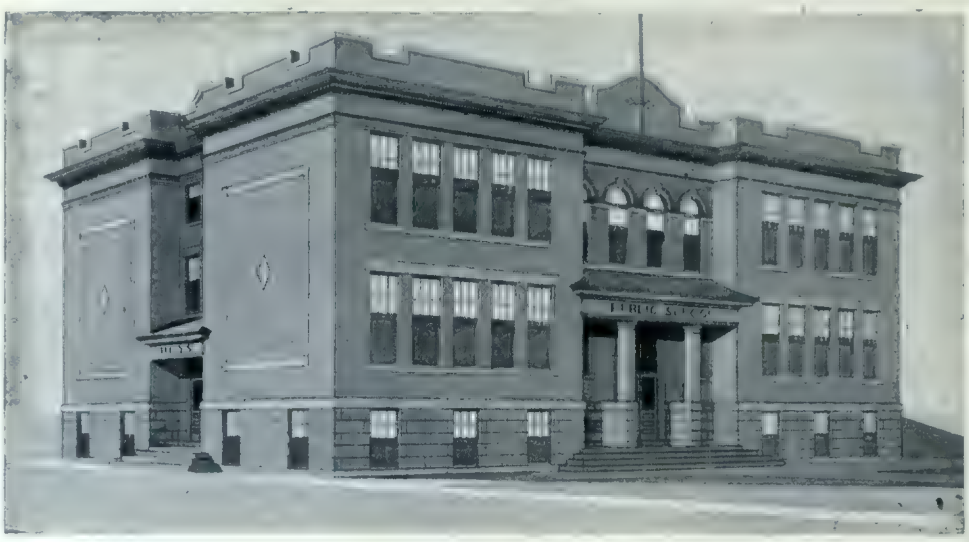
A Modern Structure of Plain Design, Having Good Proportions and Pleasing Appearance

THE foundation is of stone, all above grade being rock faced Indiana limestone, in regular courses, each stone being a header. All sills, lintels, coping or other stone trimmings are of tool finished Indiana limestone.

All stone walls of basement are lined on the inside with finished brickwork, the walls of lavatories, playrooms, corridors, etc., in the basement are of finished brickwork, being built up of best quality red pressed bricks. All ceilings in basement are plastered on metal lathing.

The lavatories, playrooms, etc., in the basement are ten feet eight inches high in the clear, six feet six inches of which is above grade. The boiler room, fuel room and fan rooms are fourteen feet high, with brick walls and plastered ceilings, the basement has cement floors throughout.

The exterior of the building is faced with fumed flashed pressed bricks, of best quality, laid up in Flemish bond with dark raked joints. All inside bricks are of good quality, pressed.



GALT PUBLIC SCHOOL. J. EVANS, ARCHITECT, GALT, ONT.

The interior of all corridor walls on first and second floors and vestibules are lined with finished brickwork the lower five feet being of fumed flashed bricks same as outside walls; this is capped with a brick dado course, and the upper portion of wall to ceiling is lined with light colored buff pressed bricks laid up in white mortar. The ceilings of corridors and vestibules are plastered.

The roofing is flashed to the coping, all brickwork from roof to coping being covered by flashing.

The roofing is laid over two-inch matched Norway pine sheathing supported on six-inch by fourteen-inch roofing timbers set five feet apart on centres. The roof is graded to two internal points and all rain water is carried down in the interior of the building. A large cistern is constructed in the basement, so that the heating boiler will always be supplied with soft water.

The main cornice and cornice to entrance porches are of galvanized iron, and all painted and sanded to the same color and texture as the stone trimmings. The main cornice is supported on iron brackets.

The roofs of entrance porches are covered with green slate, the roof water from porches is also carried to the inside of the building.

All exterior doors open to the outside and are protected by porches. Vestibules are provided at each entrance, having doors leading to basement and main corridors.

The stairs from basement to first floor are of reinforced concrete, with slate treads, and stairs from first to second floors are of steel construction, having panelled newels and strings, with slate treads and oak hand rails.

All floors of corridors and over boiler room, etc., are of fireproof construction, being of hollow tile and concrete supported on steel beams and finished with best quality hard maple flooring secured to wood sleepers embedded in the concrete. All other floors are double, the finished floor being of best hard maple laid over a spruce sub-floor, with a heavy interlining of asbestos.

All rooms are divided by thirteen-inch brick walls, and all interior trimming is of hard wood in natural finish.

Each class room has its own separate cloak room, separated from the class room by a brick wall, with door opening into the class room and also into the corridor; all doors open in the line of exit.

The blackboards are of slate, and extend across the entire front and right hand side of the class rooms, and are graded in height to suit the different grades.

The class rooms are of standard size, twenty-four by thirty-two feet, with thirteen foot ceilings. The windows extend to the ceilings, and are finished with splayed jambs, giving the maximum of light, and distributed so that there are no dark corners. All light is brought in from the left hand side of the class rooms.

All class rooms, cloak rooms, teachers' rooms, etc., have plastered walls and ceilings, with a cement dado three feet six inches extending around each room.

There are four class rooms on each floor, the first floor also provides principal's office, with private lavatory, etc., with separate closets for kindergarten and primary.

On the second floor there are lady teachers' and nurses' rooms with private lavatories in connection, each room being well lighted from the outside, and each lavatory ventilated.

The building is heated by steam, direct radiation, on the low pressure gravity return system, and the temperature regulation is under automatic control.

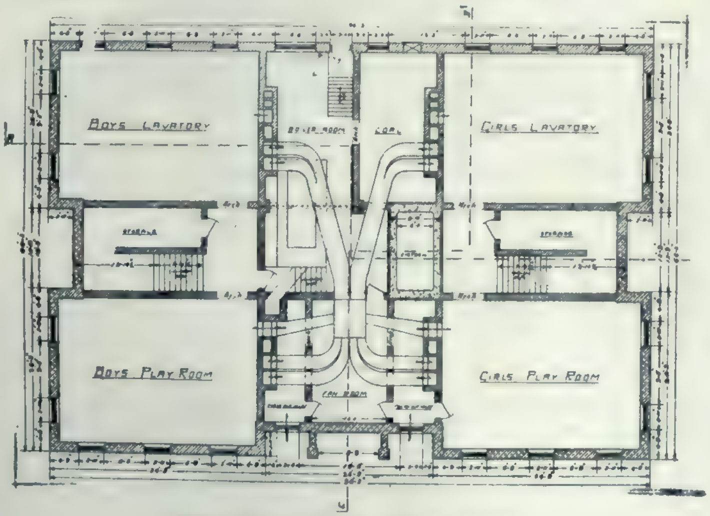
The ventilation of class rooms, cloak rooms and play rooms in the basement is on the single plenum system, the air being supplied from a motor driven fan in the basement, taking air directly from the outside and distributing it to the different rooms. The air used for ventilating is warmed by being drawn over steam heated coils, and is under automatic control, a uniform temperature being maintained at all times, same as in the heating system. Each cloak room, lavatory, etc., above the basement is ventilated separately.

The lavatories in the basement are ventilated on the exhaust system, the foul air being drawn off by an electrically operated fan in each lavatory, and discharging above the roof of the building.

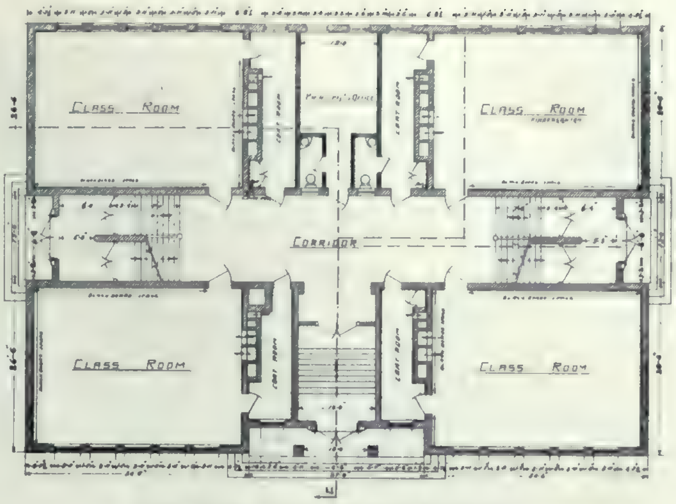
The plumbing and drainage system is very complete, all closets and urinals being individual sections divided by slate partitions, and each individual section ventilated.

Fire protection is provided by a large stand pipe extending from the basement, with flush cabinets containing valves, and hose racks on each floor and in basement.

The building is electrically lighted, and has a complete system of call bells, fire alarm system, etc.



BASEMENT PLAN, GALT PUBLIC SCHOOL.



FIRST FLOOR PLAN, GALT PUBLIC SCHOOL.

THE AMERICAN VANDAL

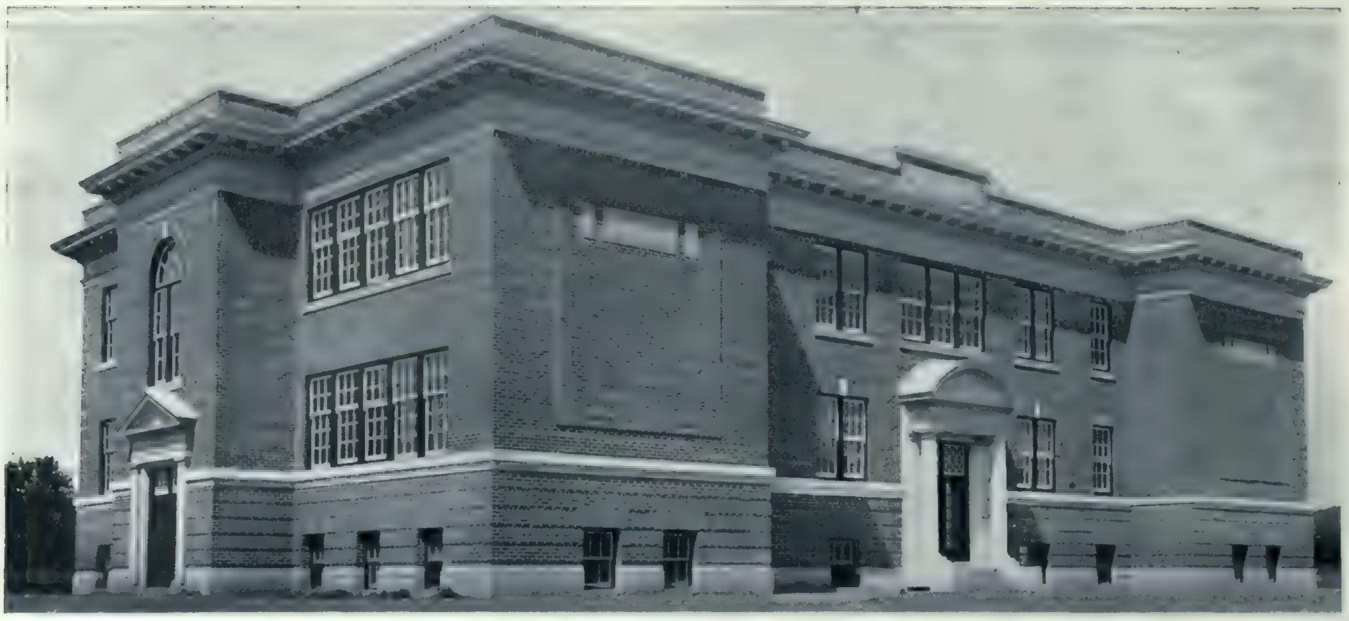
The other day we walked by a particularly attractive suburban residence. The house was good and the broad lawn showed both taste and care. Like a pretty little girl in a becoming Sunday school dress, with her hair curled, the premises made you think pleasantly that somebody's affection was centred upon it. It was so attractive that we turned into the cross street in order to walk along that side of the grounds. A garage stood at the corner of the grounds abutting on an alley; and fairly in the mouth of the alley, unavoidably catching the eye of whoever passed down the cross street, lay a heap of junk and offal, evidently thrown out from the garage and the house. The alley itself looked as though it might lead to a pigsty.

That is strictly typical. The alley, of course, did not belong to the householder, and he did not care a rap how it looked; so, with one hand he offered the passer-by a rose, while with the other he hit him in the eye with an old tin can.

Perhaps such negligence is due to the pioneer spirit, to which Nature was just something to be subdued, as quickly and untidily as possible, to human uses. But we have the habit of blaming everything disagreeable on the pioneer spirit, and the justification for it seems pretty well played out.

We do litter up the landscape abominably. It is a national habit that ought to be broken. Cities and towns should not only have ordinances forbidding unnecessary litter, but enforce them. Anywhere you will find a city spending a hundred thousand dollars or a million to make a beautiful park, and then tolerating all sorts of needless ugliness.

Any woman will tell you there is no use in wearing a fine dress along with a hat that has been fished out of a garbage can; for the dress simply emphasizes the hat. The more we spend on parks and front yards the less tolerable junk heaps and refuse-piled alleys become. What cities and towns are insisting upon reasonable sightliness?



NEW UNION SCHOOL AT BRIGHTON, ONTARIO. ELLIS & ELLIS, ARCHITECTS, TORONTO.

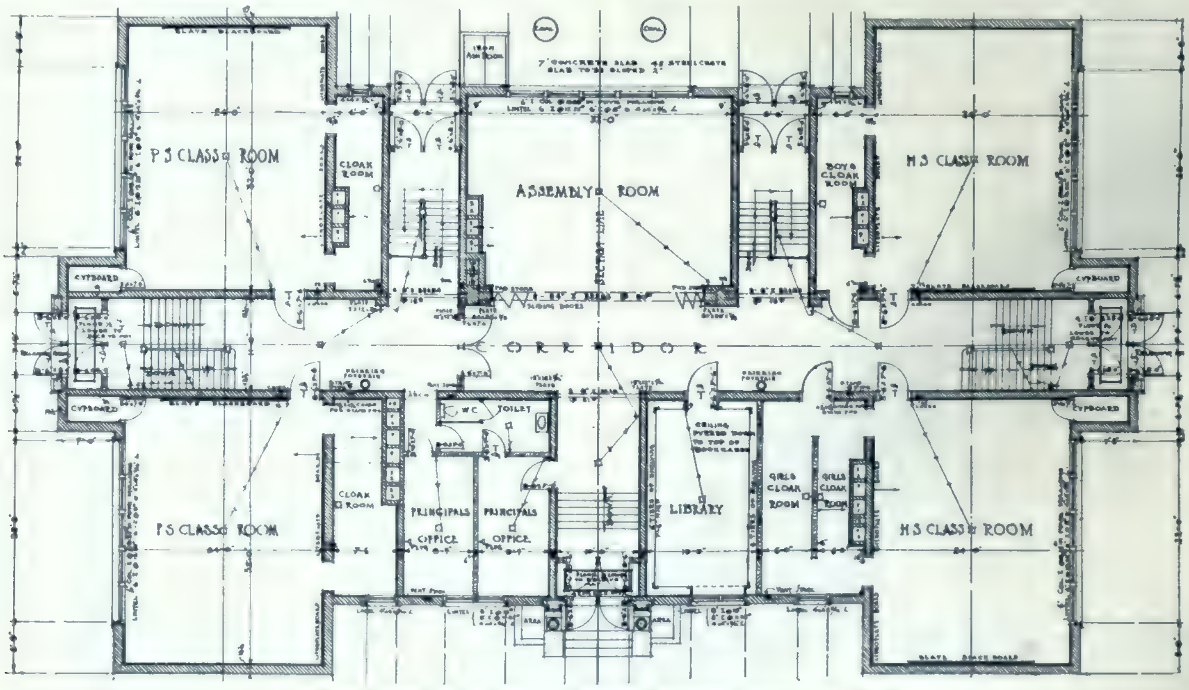
Union High and Public School Building

Unusual School at Brighton, Combining Class Rooms for Two Grades of Education.

WHEN the Board of Education at Brighton began to talk new school they found they could not finance the erection of two buildings, one for high school work and one for public school work, that would do credit to their town or site, which had been presented to the municipality for the purpose. Consequently, the architects were obliged to design an unusual school building to accommodate two grades of education.

The building erected is slow-burning construction. The basement walls are built of concrete, and the exterior walls above basement are hollow tile, faced with a rough textured red brick laid up in white mortar. The interior walls are hollow tile. Each class room is entirely surrounded with masonry, and is what is popularly called standard size. The cloak room systems are those adopted for public and high school work.

On the ground floor there are two class rooms devoted to public school, and two to high school. There are two principals' offices with a common toilet for their use only, a library with built-in



GROUND FLOOR PLAN, UNION SCHOOL BUILDING, BRIGHTON, ONT.

book cases for the high school; and a small auditorium which may be extended by sliding partitions to take in the large corridor, thus increasing the accommodation.

On the first floor there are four class rooms used for public school work, and two for high school, one of which is a science laboratory fully equipped, and an apparatus room in connection. Provision is made in science laboratory to carry off the fumes that escape from pupils' experiments, etc. On this floor also there is a roomy teachers' rest room, with a private toilet off same.

CHEMISTRY CLASS ROOM, BRIGHTON HIGH SCHOOL.

Every class room throughout has a large closet for teacher and class supplies.

In the basement there are four play rooms, one for each sex in both high and public school departments. Situated conveniently to each of these rooms are the various toilet rooms, two for each school. Each toilet room has the requisite number of plumbing fixtures. There are two storage rooms and a janitor's room.

From the play grounds at the grade there is an entrance to each play room in basement. Also on this floor is situated the boiler room and coal vault opposite same. These rooms are made as fireproof as it is possible to make them.

CLASS ROOM IN BRIGHTON PUBLIC SCHOOL.

The school is heated by steam with sufficient radiation to heat each class room to seventy degrees at ten degrees below zero and the ventilation is forced by means of a fan and motor. The fresh air is pulled through the indirect vento coils, thereby heated to the temperature of the class rooms.

SCHOOL BOARD INVESTIGATIONS

In both Toronto and London investigations are being held into the manner and cost of the operation of the school building departments.

In London the architect for one of the schools under construction is charged with accepting a commission of five per cent. on a certain contract. In Toronto the charges are more general, but it has been shown that employees in the building department have been undertaking outside contracts while drawing salary from the Board of Education.

That public education costs Toronto's citizens three million dollars a year, which is about $6 per head, or $30 per family, is the estimate of the Bureau of Municipal Research. Current expenditure, including debt charges and repairs, was $717,905 for the public schools in 1905, and $2,439,094 in 1914. The increase in expenditure on collegiate institutes was from $91,013 in 1905 to $370,518 in 1914. During the same period the increase in cost of technical education was from $42,847 to $199,481. The total on all types of schools, including commercial, increased from $851,767 to $3,058,042.

The building account shows the most striking increase in proportion to population. In 1905 it was $138,680, and the population 238,642. Population increases were steady to 470,144 in 1914, but the building account outstripped them, reaching $2,573,178 in 1914. The cost per pupil, based on average attendance, increased from $29.37 in 1905 to $51.84 in 1914, the included debt charge per pupil increasing in the same period from $3.52 to $8.89.

During 1915 and 1916 building activity has decreased, but the new Administration Building and the High School of Commerce, illustrated in this issue of Construction, have been completed, while the large new Park School, nearing completion, has been the subject of much discussion because of its cost.

The adoption of the policy of limiting school buildings to two stories will require larger school grounds, and increase building costs. So if population continues to increase, expenditures for new schools are not likely to show a decrease.

The time is opportune, however, for the introduction of economies in administration, as well as a careful scrutiny of building costs. Public money can be put to more patriotic use than paying two salaries to political favorites.

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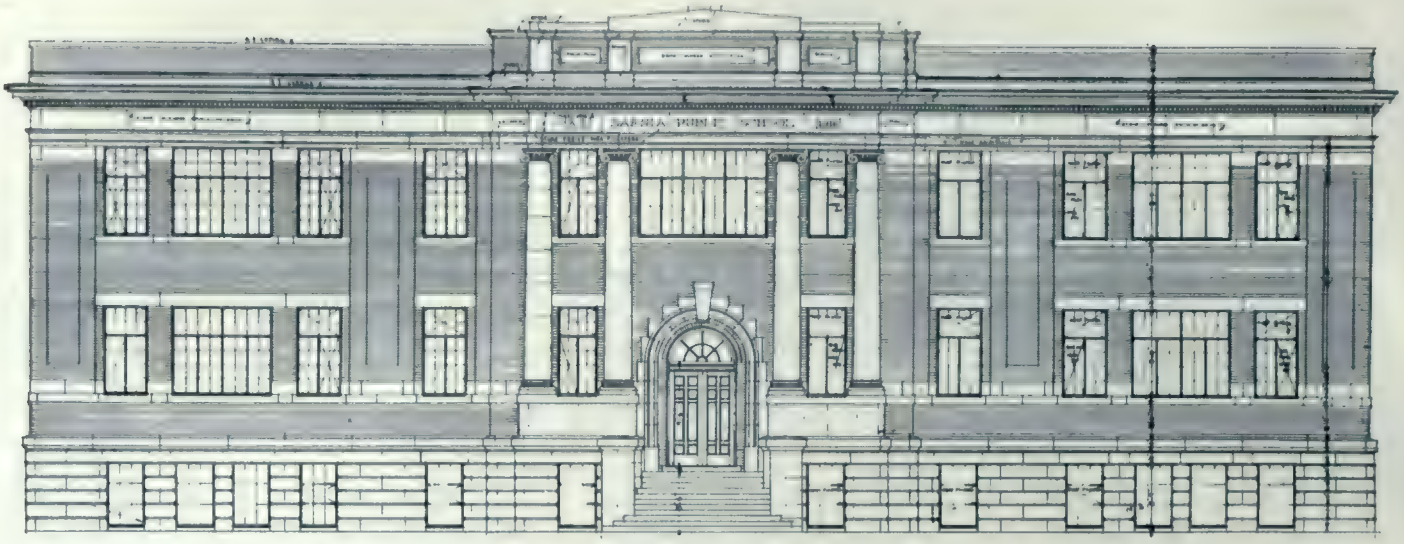
To provide Galt with more workingmen's homes, which are badly needed, the Board of Trade has appointed a committee to go ahead with the organization of the Galt Housing Association, under the Ontario Housing Act.



NEW PUBLIC SCHOOL BUILDING, SARNIA, ONTARIO. S. B. COON & SON, ARCHITECTS, TORONTO.

Sarnia's New Public School Building

Auditorium Formed by Opening Corridor Into Kindergarten Room on First Floor.

By S. B. Coon & Son, Architects, Toronto, Ontario.

BOUNDED on the three sides by streets and beautiful shade trees, this new school building is situated near the heart of the town on a level lot.

Structurally, the building is of stone, brick and tile. The basement or ground floor is constructed of Queenston limestone; the first and second stories of red pressed brick, trimmed with Indiana limestone, metal cornice and stone coping.

The main entrance faces the south, while the entrances for the pupils are at each end.

The ground floor is finished, lighted and ventilated in a similar manner to the upper floors. It contains domestic science rooms, industrial training rooms, boys' and girls' play rooms or lunch rooms, which have hardwood floors; boiler room and store rooms have dustproof concrete floors, and the lavatories have terrazzo floors.

The toilet fixtures throughout are of the most sanitary design procurable, in vitreous china.

The first floor contains four class rooms, principal's and teachers' rooms, and a primary room with a large solarium bay, and immense sliding doors to the rotunda, which forms, with the primary room, an auditorium with a seating capacity of four hundred.

The second floor contains six class rooms and a library. Special study has been given to the plan in order to distinctly separate each cloak room from the adjoining class room by a solid partition from floor to ceiling, and lighting, heating and ventilating cloak rooms separately.

The floors of all corridors are finished in terrazzo on reinforced concrete, and the stairs are steel with noiseless mastic treads, thus making the exit from all three floors entirely fireproof. The corridors are as well lighted as the class rooms, by large steel casements, which are used in all windows.

The heating is effected by means of direct steam radiators, hospital pattern, with smooth-finished round tops, wide hubs, and high legs. Ventilation is by means of the plenum system, by an electrically driven fan.

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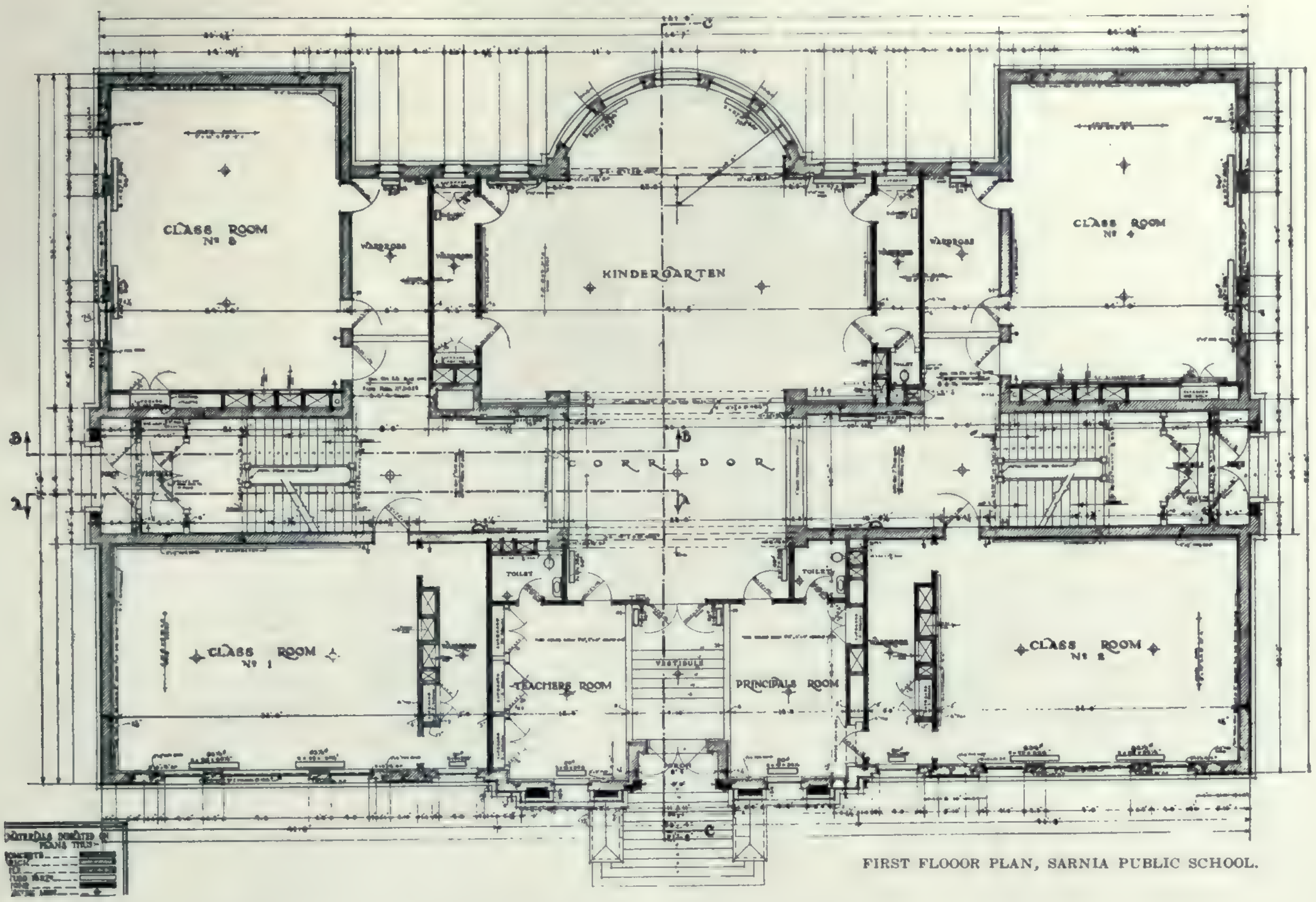
AUTOMOBILE SERVICE STATIONS

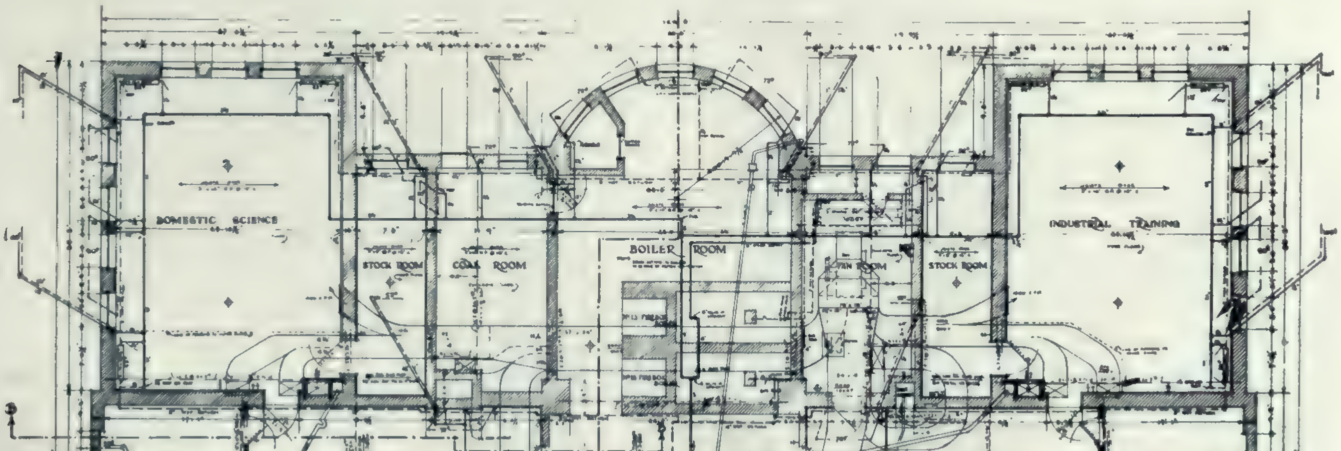
A recent issue of "National Petroleum News" published some interesting pictures of automobile service stations constructed of hollow building tile. Beautiful effects were shown to have been attained in both cases illustrated, and in describing the structures, the "News" stated that oil companies should take into consideration, in planning and building service stations, that the style of architecture employed plays an important part. Further, that with the present high prices of building materials prevailing, hollow tile, brick and stucco constitute as cheap a structure as any that can be designed. The great advantage of this combination of materials is that it lends itself easily to an attractive and harmonious style of architecture which may be determined by local conditions, making its use pre-eminently suited for service stations.

The first of the illustrations shown was that



FIRST FLOOOR PLAN, SARNIA PUBLIC SCHOOL.

of a station at Houston, Tex., which is constructed of hollow tile covered with stucco and brick, and which is roofed with a red Spanish tile. The structure is very beautifully set off by a grove of oaks, in which it is placed. The second illustration is that of a service station in Cleveland, Ohio, which was designed to be attractive in the midst of winter's snowy background, and also when set off with flowers and shrubbery.



BASEMENT PLAN, SARNIA PUBLIC SCHOOL.

Manitoba University Architectural Education

Four Year University Course and an Evening Class in Design. Examples of Some Students' Work.

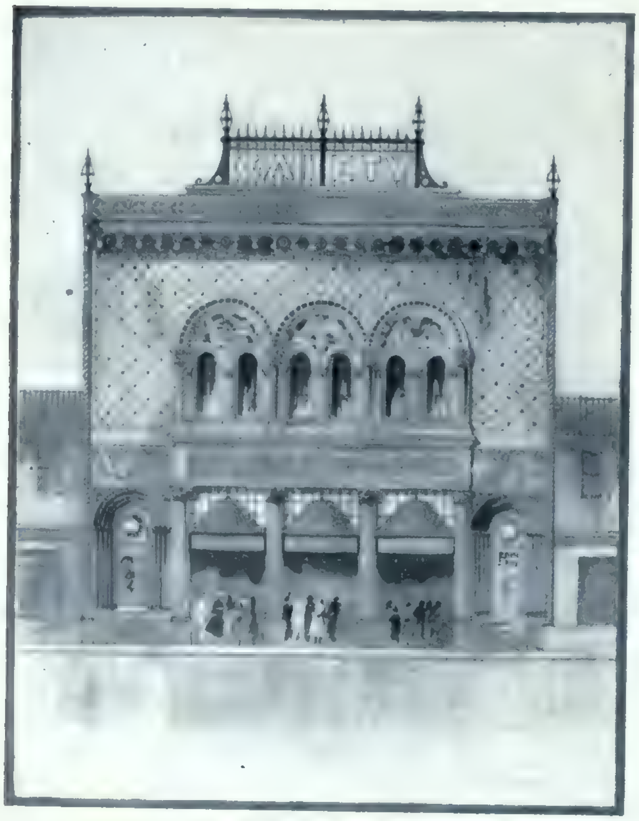
IN 1913, at the instance of the Manitoba Association of Architects, the University of Manitoba created a chair in architecture and established a Department of Architecture. Arthur A. Stoughton, a graduate of the Columbia University School of Architecture, and a pupil of the Ecole des Beaux Arts, in Paris, who had been in professional practice for many years, was called to take charge of it.

He proceeded to arrange a complete four years' course, similar in scope to that of first rate schools in Canada and the United States, which leads to the degree of Bachelor of Architecture. He has carried it on during this period, administering the principal architectural subjects and the design himself. Teaching and practical work in all the usual subjects of construction, design, theory, history, ornament, and the like, are supplemented by a growing equipment of books, plates, documents, drawings, slides, casts, models and samples.

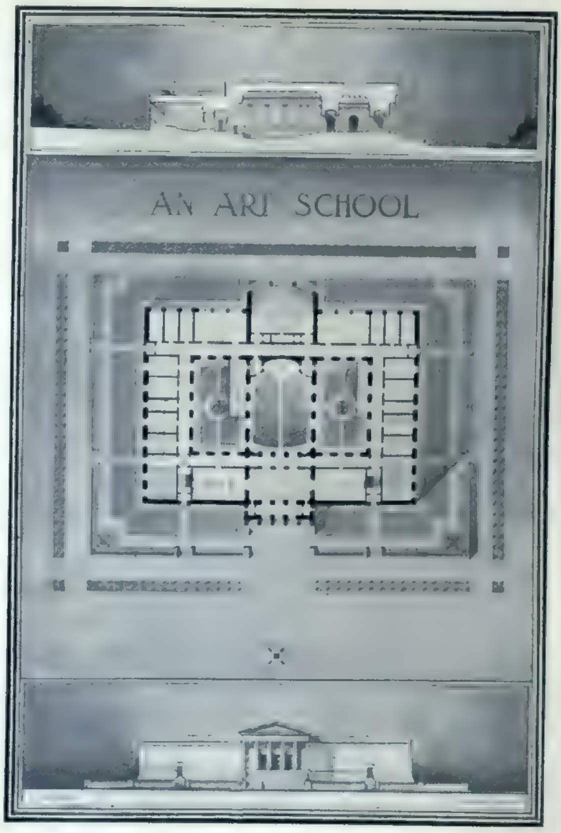
Besides the regular university courses, there has been carried on an evening class in design for draftsmen.

The department is at last properly housed with ample space and increasingly adequate equipment. The removal of a large part of the University work to the old Court House, remodeled, is a specially happy event for architecture, owing to the marked contrast between the former cramped and dark quarters in the attic of the terrace and the present accommodation by which a sufficient number of high and airy rooms of generous size are put at its disposal. Space and suitable surroundings are a great incentive to study and work and the members of the department react strongly to the stimulus. The effect of the physical change has been very beneficial.

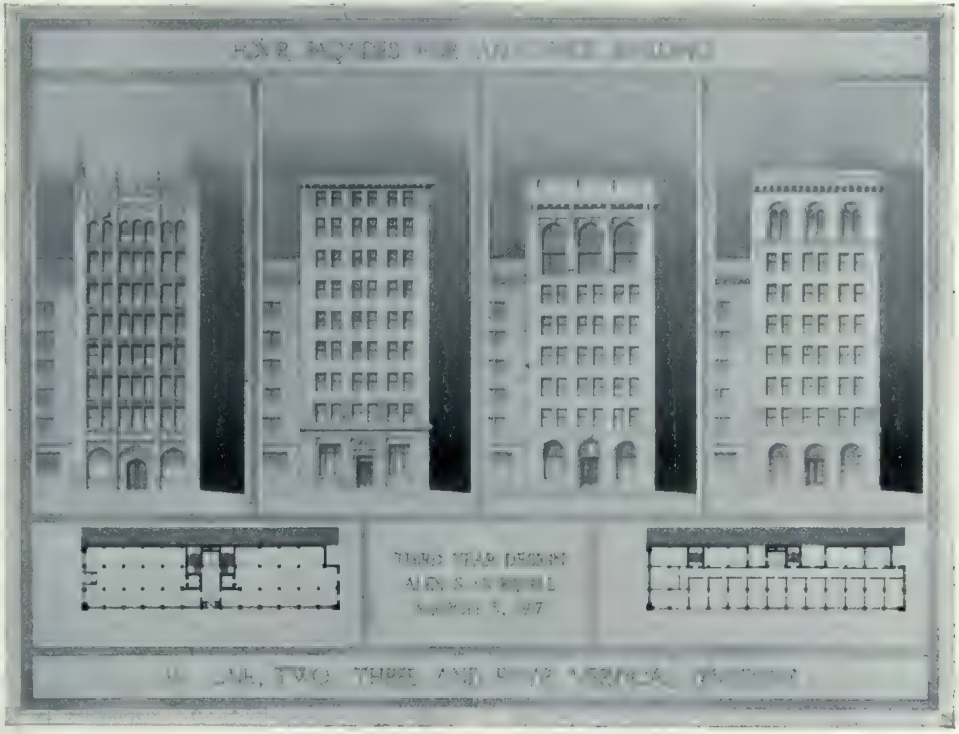
Wall and other space being available, a number of drawings by students of the Columbia School of Architecture and other plates have been framed and hung. A number of casts have been bought giving examples of architectural detail and ornament in various styles, by which the actual character and handling of carving in different periods may be closely studied. The collection of books, plates and photographs is growing rapidly, and the increasing magazine files present a wealth of illustration of current work. The library, lecture room and drafting room are now fitted in a most complete way with suitable tables, bookcases, blackboards, shelves and racks, so that books and plates may be classified and casts and illustrations displayed. Even the hall, now well lighted, makes an excellent exhibition room and the whole suite of rooms has a distinctly attractive aspect.



A MOVING PICTURE THEATRE.

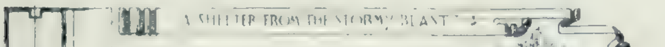


AN ART MUSEUM IN A LARGE CITY.



The important things are, however, the industry and enthusiasm of the students and work which is being done. The time table claims nearly all the hours of the day until five and some whole Saturdays, and many evenings are also spent by the men in the department, completing drawings they are interested in, or in study and examination of the very considerable collection of architectural material in the department library.

This material forms a basis for the courses in Elements, History, and Theory of Architecture, in the History of Ornament and in Design which form the main part of the distinctly architectural training. Civilization in all ages has written its story and left its record in monuments of the past. It is a fascinating pursuit to spell out the sentences of this world's history in the changing features and details of the architectural periods. It is only through a grasp of the rationale, origins and development of the elements of architectural design that we can get a proper point of view and secure the key to the solution of the present-day architectural problems. For architecture to be a vital art, then or now, it is necessary that it should answer to all practical requirements; should have constructive soundness and charm of form, and be the reflection of the needs and aspirations of the people. Lines of origin and development of forms and ornament are therefore described; principles of composition are elucidated and the significance of all these is made clear by reference to the photographs, plates and pages of the periodicals. At the same time the artistic possibilities of the various materials used in the structure and decoration and their craftsmanship as affecting their form as well as their harmonious combinations are carefully considered historically and for present-day use.


A SHELTER FROM THE STORMY BLAST

PRINT OF A TWELVE-HOUR SKETCH PROBLEM BY HERBERT JOSEPH.

Good architecture must be based on sound construction however, and a large place is therefore given to mathematics, the sciences, the properties and use of steel and wood, stone and concrete, and other materials used in building, and their technical and practical application for architectural purposes. The methods of embodying these requirements in drawing and specifications are also treated. The subjects of heating and ventilation, plumbing and drainage, electric lighting, acoustics, specifications, building construction and office practice are taken up in special courses.

Good sound construction and architectural design are thus made central in the training of the architect. Design is a many-sided work and it is pursued in a variety of forms. Gathering up its materials from past periods through a development as long as the ages, and receiving its inspiration from the art instinct of mankind, architecture addresses itself to the splendid effort of creating structures of beauty, perfectly fulfilling their purpose and answering to present requirements. In other words, it seeks to solve all the practical problems in buildings which shall have the added charm of fine proportions: well related masses, and well chosen materials; suitable details and proper embellishments. There is a wide range of subjects and an embarrassment of choice in covering the field in the time at the disposal of the students.

There are public and government buildings; semi-public, as libraries, theatres, churches, schools and institutions. There are office buildings, stores and factories; there are houses, large and small; there are single buildings and group plans and town-planning schemes; there are the landscape treatment of grounds and the architectural embellishment of cities, such as monuments, bridges and park structures. There is the design of mass and detail, and of ornament and interior decoration. There is the creation of effects in material, texture and color. Most important of all, there is the execution of one's ideas in the actual materials of the finished building. Thus, finally, the creation of the imagination becomes real and objective and the plan and the exterior and interior effect, including the surroundings without and the furnishings within, present a complete and harmonious composition.

Some illustration of the scope and variety of the work in design and drawing is given on these pages. The larger cuts show original compositions, with shadows accurately cast, tendered in India ink washes. The office building problem called for four variations on one theme—several compositions and styles adapted to the same plan, involving a study of mass and detail. Other programmes during the year have been a monument, a small private house, an art museum in a large city, and the staircase and central rooms of a federal building. The study and presentation of each of these in the way shown cover a period of four or five weeks. From time to time a whole Saturday is devoted to a twelve-hour design of some small structure or decorative composition, rendered in pencil or pen and ink. The evening class in design for men who are occupied in offices during the day, has continued its work during the year.

Summer work is required in the form of time spent in an office or on a building operation, out-of-door sketching in pencil or water color, drawing from the cast, or a report on a study of some subject or book related to the course. A number of sketch problems also will probably be worked out. The men of the department who are in service are urged to "keep their hands in" by making sketches wherever they may be and, where it is not impossible, even doing sketch problems in design of subjects suggested by the department.

CANADIAN BUILDING WOODS

The Forest Products Laboratories of Canada, established at Montreal by the Department of the Interior, in co-operation with McGill University, have undertaken an investigation of the woods of the different species of trees in Canada, so that reliable and authoritative information may be available as to the strength, durability, and other qualities of Canadian woods and their adaptability for use in structural work and manufactures of various kinds. Such investigations have only begun at the Canadian Laboratories, and the only Canadian species in regard to which fairly complete information has been obtained is Douglas fir, but as there is a special interest at the present time in regard to structural timbers, particularly in a comparison between Canadian and foreign timbers, it has been considered advisable to issue a preliminary study on structural timbers, using the information now available from many sources, and particularly the results of investigations made at the laboratory of the Forest Service of the United States. This preliminary report, entitled "Canadian Woods for Structural Timbers," is now being distributed by the Department of the Interior as Bulletin No. 59. It will be found that Canadian timbers rank high for structural purposes. The results of an exhaustive series of mechanical and physical tests of Douglas fir made at the Forest Products Laboratories of Canada are now in course of publication, and similar tests of other important Canadian woods are in progress, the results of which will be published as soon as they are available.

A DISCOVERY IN OLD BUILDINGS

A new type of prehistoric building—the pueblo constructed in the open and unattached to cliffs—has been discovered in the Mesa Verde National Park of the United States in Colorado by J. Walter Fewkes of the Smithsonian Institution. In announcing the discovery, the Institution estimated that the specimen unearthed, resembling in most particulars the terraced community building of the cliff dwellers, might date back six centuries. The pueblo is in the Mummy Lake group, and Dr. Fewkes believes there are many scores of similar structures near. It contains forty domiciliary rooms and four circular, ceremonial kivas on the two floors resurrected, and there are evidences that originally a third story topped the structure.

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An old octagonal brick chimney 125 ft. high and 12 ft. in diameter at the base, belonging to the Solvay Process Co., Detroit, was so badly weathered that a large quantity of mortar had fallen out of the joints, and much of the brick was eaten away to a maximum depth of several inches. The chimney was repaired at a cost of about $1,500 by thoroughly cleaning the exterior surface, removing the loose mortar and soft brick, and enclosing it with No. 28 A-1 triangular mesh furred out 1 in. from the original surface of the brick. The metal fabric was then enclosed in a solid mass of concrete with a minimum thickness of 2 in. beyond the original surface that was shot into place with a pressure of about 50 lb. per square inch.

Development of Vacuum Steam Heating

By A. J. Dickey, Toronto.

HEATING of this form is truly a twentieth century development. Like other of the engineering sciences, the development in heating has taken place under the pressure of necessity. Our present day sky-scraper would have no place in the affairs of men were it not for the development of the science of structural engineering that has provided the steel skeletons. The change in the character of our buildings due to the advent of steel, has brought with it development in every other line, and one of great importance to the architect is "Heating."

In the early days of steam heating and small office buildings, the radiators were formed by a continuation of steam pipes direct from the boiler and back again, without valves for regulating the amount of heat. The heat to be emitted to the room was regulated by covering or uncovering the hot steam pipes to meet the requirements. By degrees the one pipe steam system was evolved with its single pipe connection to conduct the steam to the radiators, and the water of condensation away by the same route. In one respect at least, the original system had an advantage over this one pipe system, in that over-heating was dispensed with through the partial covering of the radiators or steam coils; the one pipe system requiring to be turned "on" or "off" entirely. Both the early and later type system were susceptible to troubles from air in radiators and knocking in pipes and requiring keen manipulation to get rid of either.

The next development was the two pipe steam system, with one pipe supplying steam to the radiator and another one carrying away the condensation. This system answered the requirements very well, at least satisfied the demand at that early time, until tall buildings became a necessity.

The death knell of the one and two pipe plain gravity systems was sounded with the erection of the first tall office building. It was apparent that some means besides the pressure of the steam must be provided to facilitate anything like an even distribution of steam through the radiator. As a result, a mechanical means of drawing on, or creating a "pull" on the returns from the system was provided. It proved a big improvement, but as new buildings increased in size, it became strongly apparent that some means must be provided to intercept the flow of steam from the radiators into the return piping system, and do it automatically, without obstructing the free exit of air and water of condensation.

The extraordinary need for a satisfactory radiator trap for vacuum heating has brought many different types in different stages of perfection onto the market, but experience has pretty well established the superiority of the thermostatic type trap, because of its automatic operation over such a wide range of pressures within the heating system.

There are some architects that cling to the old type one or two pipe systems of heating, either because they secure exceptional results or they are not posted on the results to be gained from vacuum steam heating; we might add also, vapor heating.

Vacuum heating is the name applied to that form of steam heating which provides a system of steam piping for conducting steam at one-half to one pound pressure to the radiators, and a distinct system of return piping for carrying the air and water away from the radiators, with some mechanical means provided for the extraction of the air and water of condensation from the return piping system.

A vacuum pump, either steam driven or electrically driven, is the mechanical means provided for the extraction of the air and water and to create the pull on the return line system.

It is quite obvious that if all the points in the steam supply system that collect air and water were connected direct to the return piping system without some device to prohibit the passing of steam, then the steam will leak past steam main drip, and from radiators into the return piping system, and will expand in its gaseous form to dispel the "pull" of the vacuum pump, with the result that the mechanical means provided would do no useful work.

It is quite as obvious then, that if on the end of each and every radiator and every steam main drip a steam trap is imposed that automatically passes air and water of condensation under varying pressure conditions, and at the same time prohibits the passage of steam, then under such conditions, the vacuum pump does do useful work by creating a "pull" on the returns of the heating system which extend to each and every steam trap and with the obvious result that there is a positive "differential" in pressure between the steam supply to a radiator and the return from it.

This means positive circulation with immediate response on opening of the control valve on the radiator.

In view of the importance attachel to the functions of the steam traps in vacuum heating, it is fitting that mention be made of some of the features necessary, yes, even vital, to the successful vacuum system, and that should continue so year after year.

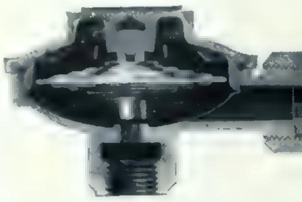
For illustration, the writer will refer to a radiator trap and compare it with what we might impose as an ideally perfect trap.

Major functions: 1st—Pass air; 2nd—Pass water; 3rd—Close for steam.

These major functions must be performed continuously and under varying conditions of steam pressures.

In addition, it must be a trap of certain minor functions:

1. Simple in construction.
2. Free of loose or sliding parts to avoid sticking and thus interrupted operation.
3. It must not clog up.
4. It must not get out of order.
5. It must have long life.



The cut here illustrates a section of a radiator trap, and represents the interior arrangement with the heart of the trap, the corrugated hollow, diaphragm disc, permanently fastened into the cover, but suspended directly over the discharge opening of the trap.

This trap is known as the Hollow Disc Thermostatic type. The corrugated disc member is charged with a combination of volatile fluids and the disc hermetically sealed under predetermined correct condition. The fluids thus sealed never can lose their power of expansion or contraction under varying temperature conditions.

The disc in each trap should be carefully adjusted to perform the three major functions—pass air, pass water, and close for steam. The volatile fluids used, together with the hollow corrugated disc construction, provide that these major functions are performed over the range of pressure from 15 inches vacuum up to 10 lbs. steam pressure.

Dealing with the minor functions:

It is apparent that nothing could be more simple. Air and water has a direct passage from radiator to return pipe. Disc member is susceptible to temperature conditions in the radiator and responds to them.

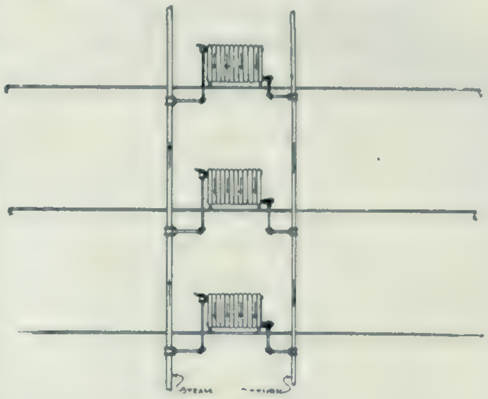
It is free of any loose working parts; there are no sliding contacts to collect grease and dirt.

It is very unlikely to clog up because of the very large opening through the trap and the clearance between the valve and its seat.

Since the perfection of the vacuum trap, a newer and larger field has opened up in vacuum heating and vapor heating. Numerous vacuum systems operate on a vacuum condition *in the radiators* instead of steam pressure. All objections formerly caused by air-binding, water hammering, poor circulation, have been removed, and economies of startling figures have time and again been produced.

Any large or small industrial plant should have vacuum heating, it is the proven method in which heat can be circulated to each radiating unit, and, further, such a system lends itself to plant extensions readily.

Large buildings, groups of buildings and office buildings, where exhaust steam is available, should by all means have vacuum heating, with the other up-to-date devices for controlling temperature and humidity automatically.



The drawing shown here will serve to forcibly impress the value of traps on vapor heating system in smaller office buildings, schools, hospitals, residences, etc., if the following is kept in mind.

The radiator connections should be made with supply at the top of hot water type radiators. The reason is plain when you consider that air is heavier than steam and will naturally settle to bottom of radiator, permitting of an even, free circulation in the radiator.

As the lower radiators in the system fill entirely with steam, the trap closes and no steam, consequently no pressure is built up in the return piping system, and only a small pressure is necessary on the supply piping system to effect circulation, as each radiator trap on the system, in its turn, will close when the radiator it is connected to is full of steam.

This is simply the natural following of nature's laws and, after all, our tasks are always easier when we take advantage of nature's assistance instead of working against the laws.

The adherence to this principle in the case of the vacuum system in the Woolworth Building, New York City, the highest building in the world, was responsible for complete circulation through all radiators with about four ounces pressure on the feed mains in sub-basement. This test was made before the vacuum pumps were started up.

It is obvious that there are great possibilities for vapor heating in buildings that do not require the vacuum system. The vital difference is the absence of a vacuum pump in a vapor system, in which case the air from the system is vented to atmosphere from the return system through open free vent, and water of condensation returns to the boilers by its own weight.

WAR'S EFFECT ON U. S. BUILDING

The *Architectural Forum,* commenting upon the entry of the United States into the world war, draws attention to the need for industrial building and proper housing for munition workers, and makes the following comment of equal interest to Canadian and United States architects:

"A good many architects have a tendency to fall in too readily with the condition we call business depression, and quietly wait for 'bad times' to become better, the meanwhile deploring the timidity of actual or prospective clients, yet doing nothing to influence opinion or improve matters. This attitude is in direct contrast to that which they should display. Architecture is a creative force, and architects should assume the role to which their profession entitles them. The architect is given the power to visualize, and this great advantage should be used in a constructive capacity. He should not be content to follow conditions as others make them, but by the very nature of his profession he should be a moulder of opinion and himself a maker of conditions.

"With the entry of the United States into the world war, it was only inevitable and natural that the architect would encounter timidity on the part of clients occasioned by uncertainty as to future happenings. This should not be a signal that building operations have come to an end or that the profession of architecture should go into retirement till peace has been declared and our daily routine restored to its normal, comfortable pace. It should be the opportunity for the architect to rise to the full height of his power and give constructive evidence of his ability.

"The inevitable expansion which will come through the enlarged sphere of this nation's influence will require much necessary private building, both commercial and residential. The architect may, however, well ask: What of that all-too-familiar individual, the man who needs to build, but feels he will be wiser to wait until conditions are more settled before he goes on with his building project. Conditions, after all, are largely what this man and a few hundred thousand like him are timid enough to make them. The very thing which they individually deplore is a creation and figment of their own collective weakness. The application of a little constructive psychology, directed and charged with sound judgment, forceful personality, and strong confidence, will go far to offset this temporary nervousness on the part of clients. Business as usual may be (as some English people found it) a damaging fallacy if used merely to inflate unwarranted optimism, but certainly any tendency toward the general suspension of business is a policy not only detrimental, but actually destructive, and hence unpatriotic.

"Let the architect exert all his power toward the strengthening of general confidence and against any tendencies which reflect unfounded timidity. Let him also, at this time of intense co-operation among all citizens of this nation, expect more from himself; let him see the part he may play in meeting present problems. Every American architect to-day should be conscious of his true relation to the industrial world, especially in the realm of the building trades, and should be fired with a convincing patriotic zeal to keep architectural activity alive through every means in his power, be his project large or small."

◆

Doing nothing for others is the undoing of one's self. We must be purposely kind and generous, or we miss the best part of existence. The heart that goes out of itself gets large and full of joy. This is the great secret of the inner life. We do ourselves the most good doing something for others.—Horace Mann.

◆

The formula for the successful business man is the same as for all earthly endeavors. Love your business and the work which you are here to perform; be endowed with an imagination that can build an ideal for you to work towards, and then be blest with a continuity of purpose that can and will make your dreams come true.

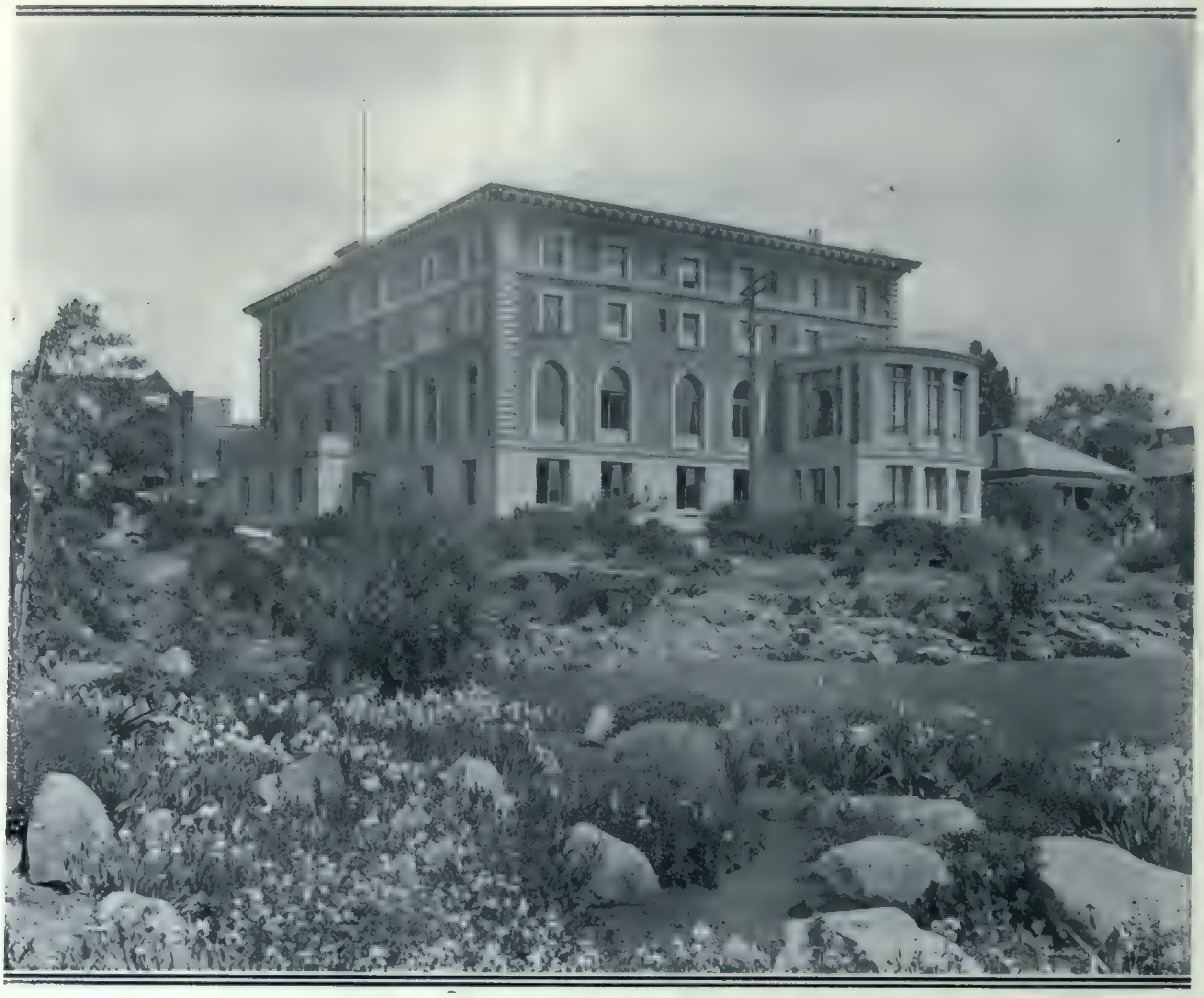
◆

From the Court of Appeals of California we have a decision to the effect that where a building is completed pursuant to contract, an architect's certificate may not be rightfully refused, and the contractor may recover a balance due him without presenting it, in a case where the property owner has waived previous certificates from the architect.

◆

The French Government has given a contract to Kennedy, Mitchell & Co., of New York and London, for rebuilding some of the devastated towns and villages. The arrangement has been carried out by the Bank of France and one of the first New York banks, and the contract is for $40,000,000. The present contract, which applies to the Argonne and the neighborhood of Verdun, is only the precursor of many others.

AUDITORIUM IN ABERDEEN SCHOOL, MONCTON, N.B.



UNION CLUB, VICTORIA, BRITISH COLUMBIA.

A GARDEN AT THE RESIDENCE OF MR. STUART STRATHY, TORONTO.

CONSTRUCTION
A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

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RICHARD G. LANGRILL, Assistant Editor and Manager

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Canada's Confederation Celebrated

The corner-stone of Canada's new Parliament Buildings was laid at Ottawa on July 2, the fiftieth anniversary of the birth of the Dominion.

In 1867 Canada comprised four provinces, embracing a narrow strip along the lower lakes and the St. Lawrence, with a limited frontage on the Atlantic. In 1917 there are nine provinces (besides a large unorganized territory), embracing half a continent, stretching from the Pacific to the Atlantic, and from the United States to the North Pole.

From an area of 540,000 square miles, and a population of 3,600,000, Canada has grown to 3,729,665 square miles, and about 7,600,000 population.

In 1867 immigration was small and sporadic. In 1913 it reached 402,000, and in 1914, 385,000. Canada, since 1900, has taken the place of the United States as the chief magnet for old-world immigration.

The total value of Canadian field crops rose from $195,000,000 in 1901 to $841,000,000 in 1915. The value of live stock is estimated at $800,000,000.

At Confederation there were 2,278 miles of railway in Canada, with an investment of $257,000,000. To-day there are 35,582 miles, involving a capital of $1,876,000,000.

The value of lumber products in 1871 was $34,156,483; at present it is about $175,000,000.

Imports in 1868 amounted to $68,500,000; in 1917, $845,300,000. Exports in 1868 were $45,500,000, as compared with $1,151,300,000 for 1917. Customs duties amounting to $8,800,000 were collected in 1868, compared with $147,600,000 for the fiscal year ending in 1917.

Thirty-five Canadian cities issued building permits totalling $38,783,994 in 1916, and $32,285,721 in 1915. Fifty-two Canadian cities issued building permits totalling $166,114,508 in 1913, and $94,807,577 in 1914.

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Thrift in Building Costs

The high cost of many classes of building materials has raised a serious problem for architects and has prevented the erection of many buildings for which plans have been drawn and building funds arranged for.

An architect in an Ontario city, for instance, prepared plans for a residence for a client, but when the figures were secured from the contractors, the prospective builder found it impossible to go ahead, so much higher were the figures than his estimated cost. By substituting stucco board for brick, however, the costs were lowered and the building gone ahead with, instead of being indefinitely postponed.

While retaining the principle of using the highest quality of building materials, the present is a time when every worthy substitute which commends itself should be considered. Building costs are likely to remain high for several years, and anything which tends to lessen the cost will help to encourage a renewal of building activity.

◆

Building Permits Show Increase

While permits in many Canadian cities are not so numerous as during the active spring months, both Toronto and Montreal showed a substantial increase for the six months ending June 30.

Toronto's figures for June, 1917, were $693,244, compared with $573,889 in June, 1916, and for the six months, $3,326,228, compared with $2,684,409, an increase of $641,919, for the first half of the year.

Montreal permits for the six months totalled $2,466,659, an increase of $32,315 over the total of $2,434,344 permits issued during the first half of 1916.

The figures for all Canadian cities are not available as yet, but as the large cities show an increase, and the Western Provinces are also "coming back" with increased building expenditures, there is every reason to feel that the figures for all Canada will show a gain, not only for the first half of 1917, but also for the whole year.

Recent Quebec Legislation Affects Builders

An Address by Andrew R. McMaster, K.C., Before the Montreal Builders' Exchange.

AT the last session of the Legislature of the Province of Quebec, some very important changes were effected in the privileges accorded to workmen, suppliers of materials, builders, and architects, on the property of which the value has been increased by their work or materials. I will endeavor to sketch the new features of the law, wherein it differs or resembles the former enactments, and what procedure must now be followed in order to avail oneself of the advantages conferred.

To devise a satisfactory law of builders' privilege is not an easy task. There are several interests which may conflict—that of the workman, that of the supplier of materials, that of the builder, and that of the owner. The task is rendered more difficult by the attitude of many principal contractors and owners, who seem to regard the registration of privileges not merely as burdens placed on the properties in which they are interested, but as in very deed hostile acts warranting immediate reprisals by way of loss of contract or otherwise.

The supplier of materials and the sub-contractor is often between Scylla and Carybdis—fearful of losing his rights as a privileged creditor if he does not register and fearful of losing at least the good-will of the principal contractor, the architect, and the owner, if he does.

The new law, as did the old, gives to the workman, the supplier of materials, the builder, and the architect, a right of privilege over other creditors on the immoveable, but only to the extent to which their work and materials have enhanced its value.

NEW LAW CHANGES ORDER OF PRECEDENCE.

A change made affects the order of those entitled to the privilege. Under the old law the order of precedence was as follows: The laborer, the workman, the architect, the builder, the supplier of materials. Under the new, the laborer and workman are combined, the word "workmen" being used to designate "the artisan, the laborer, and generally everyone who makes his living by manual labor"; next comes the supplier of materials; next the builder, which term includes both contractor and sub-contractor; and last the architect.

The privilege of the workman exists for arrears up to twenty days, whether he was engaged by a proprietor putting up a building for himself, or by a contractor. No formality is necessary for the creation or preservation of this privilege, and it lasts until thirty days after the construction is ready for the use for which it is intended. Within this thirty days the workman must sue his debtor, who will usually be the contractor or a sub-contractor, and he must call the proprietor and the registrar into the case.

In order to protect the proprietor against this undisclosed hypothec or mortgage on his property, the law allows him to retain on the contract an amount sufficient to pay these privileged claims, and refuses to the builder the right to exact any payment on account of the contract price before furnishing to the proprietor a statement of all amounts due by him for labor and materials.

NEW LAW MORE CERTAIN.

The provisions of the new law differ somewhat widely from the old. Under it the workman did not have to register his privilege so long as the work was being proceeded with, but he had to give notice to the proprietor of the fact that he had not been paid, either in writing or verbally before a witness, when each payday came round. Then within thirty days from the time the building had become ready for the purpose for which it was intended, he had to register his claim.

The trouble was that, under the old law, the workman who availed himself of his rights and gave notice to the proprietor, was himself only too often the recipient of a notice to immediately quit his job. The new law, in restricting and limiting the privilege, has made it more certain.

The supplier of materials is given a privilege on the building in which the materials supplied to the owner or builder have been used or for the construction of which they have been specially prepared.

The privilege is created by the registration of a notice given to the creditor or his representative, and applies only to those furnished or specially prepared, but not delivered, for the immoveable in question. The law offers one striking novelty. It gives the supplier of materials a privilege for the price of materials specially prepared for a building, although they have not been delivered on the job or incorporated into the building. The law also grants to the unpaid supplier a right to revendicate, in case of the insolvency of owner or builder, the materials he has supplied, so long as they have not been incorporated in the building.

SUPPLIER OF MATERIALS HAS MORE RIGHTS.

The old law merely directed the supplier to advise the proprietor of the contracts made by him for the delivery of materials before they were delivered, mentioning their cost and the immoveable for which they were intended. Failure to give this notice lost the supplier his privilege. The old law further provided that, in order to meet the privileged claims of the supplier of materials, the proprietor was entitled to retain on the contract price an amount equal to that mentioned in the notices he had received. The supplier, to retain his privilege, must now sue his debtor within thirty days of the date at which the construction is ready for the purpose for which it was intended. Under the old law the supplier had to sue within three months of the giving of the notice to the proprietor if he desired to retain his privilege. This often brought about an absurd state of affairs, in that the delay for suit had often expired before the merchandise had been used, or even before all of it had been delivered.

In many cases—perhaps in most—the sub-contractor is also a supplier of materials. In such event he should conduct himself as such, giving what notices are required.

In the event of being merely a sub-contractor, to create this privilege he must advise the proprietor of the contract he has made with the principal contractor, and within thirty days after the end of the work he must register his claim and give notice to the proprietor. He only gets a privilege for the work he does subsequent to the notice that he has given the proprietor of his contract with the principal contractor. In other words the creation of his privilege is subjected to two conditions—first, a condition precedent the notice to the proprietor of the subs' contract with the principal contractor; second, a condition subsequent: the registration of a statement of his claim within the stated delay. Within six months after the end of the work a suit must be taken, or the privilege will become extinct.

The proprietor may retain, on the contract price, sufficient to meet the claims of the sub-contractor. Under the old law, the sub-contractor was obliged, in order to create his privilege, to advise the proprietor of his contract with the principal contractor within eight days of its signing, and, if he failed so to do, he lost his privilege. The new law is fairer and less rigorous.

THE BUILDER AND ARCHITECT'S CLAIM.

The builder or the architect's claim is created by the registration within thirty days after the end of the work of a statement of claim of which notice is given to the proprietor within the same delay.

As far as the workmen's claim is concerned, no notice or registration is necessary, but the workman must take a suit against the debtor within a delay of thirty days after the end of the work. In this suit the proprietor and the registrar must be brought in, the proprietor because his property is sought to be charged, the registrar so that he can make note of the suit in his books, and thus give warning of the existence of the privilege to anyone proposing to buy or lend money on the property. In order to obviate a multiplicity of suits for small sums the law provides that several workmen may join in one action.

In dealing with the procedure involved in this department of law, it will be noted that two basic requirements are laid down—notice to the proprietor of the immoveable and registration. The notice to the proprietor is to advise him of the rights which are being created against his property, the registration is to advise those desiring to deal with the owner concerning the property, or with the builder, of the situation.

Following out these principles, we have seen that the supplier of materials obtains his privilege only upon the registration of a notice which has been given to the proprietor, and applies only to those supplies furnished or specially prepared and not delivered, after the registration of such notice.

The privilege so created will become extinguished after thirty days after the end of the work, unless the supplier takes a suit meanwhile, into which he must call the proprietor and the registrar.

SUB-CONTRACTOR'S COURSE OF ACTION.

The sub-contractor to create his privilege must, as we have seen before, advise the proprietor of the contract he has made with the principal contractor. I believe it would be well to have this notification to the proprietor served by a bailiff, or, if the mails are used, sent certainly by registered letter. Registration, in the registry office, must follow within thirty days of the end of the work.

An amendment of article C.C. 2103 repeats some of the provisions already enacted, but conveniently and clearly sets forth the essential characteristics of the notice or memorial of the creditors' claim: (a) The claim must be drafted in the form of an affidavit of the creditor or his representative and sworn to before a justice of the peace, a commissioner of the superior court, or a notary; (b) it must contain the name, occupation and residence of the creditor; the nature and amount of the claim, and the cadastral number of the immoveable upon which the construction is being placed.

I consider that the following practice will meet fully the requirements of the law and also be found convenient:

That the claim be prepared in triplicate. That at the foot of the claim there be appended a notice to the proprietor, drawing his attention to the claim, and a further notice to the registrar, requiring its registration. Let the claim and notice be served on the proprietor by a bailiff, and then put before the registrar both the remaining documents, asking him to affix his certificate of registration to both. Then file with him the document which does not bear the bailiff's return or affidavit of service, and retain the one which does. The privileged creditor will thereupon have in his possession a copy of his claim bearing upon it satisfactory proof of its having both been served and registered.

CANCELLATION OF PRIVILEGE.

A further amendment which has been made, and which I believe will prove useful, is the following:

After the expiration of six months after the date of the registration of any privileged claim, or from that date to the end of the work, whichever be the latest, if no action has been taken to preserve it, any interested party may call upon the registrar to radiate the privilege by the following procedure:

The party interested prepares an application to the registrar demanding the cancellation on the ground that the six months from the end of the work or the registration of the claim, whichever be the latest, has expired; this application he supports by his affidavit. Then, in order that an opportunity be afforded to the privileged creditor to take such steps as he may deem necessary to protect himself, this application must be served on the privileged creditor or his representative eight days before it is filed with the registrar.

If a suit has been taken, the registrar is bound to radiate the registration, not only by direction of a judgment, which might go without saying, but also on production of a certificate from the prothonotary that the action has been discontinued.

RAPID DEVELOPMENT OF THE HIGH BUILDING.

In less than two decades the tall building in New York has doubled in height.

The highest building in the world used for office purposes in 1899 was the Park Row Building, opposite the New York City Post office. It is 382 feet high. The Woolworth Building, since erected, on the opposite side of Broadway, is 792 feet high.

CONSTRUCTION NEWS

Information of Special Interest to Architects, Contractors, and Manufacturers. Construction Building Reports will Give You Up-to-date Information Every Day on all New Buildings About to be Erected or in Course of Erection.

BUSINESS BUILDINGS.

Chatham, Ont.—The Canadian Bank of Commerce, Toronto, contemplates alterations to their bank, at the corner of Sixth and King streets.

Hamilton, Ont.—The Bell Telephone Company, Hamilton, are erecting an exchange building at the corner of Garfield and Dunsmuir streets, to cost $30,000, and have awarded the following contracts: mason, brick work, concrete and terra cotta, H. Yates, 24 Leeming street; steel, Hamilton Bridge Works Company, Limited; carpenter, John Poag & Company, Westinghouse avenue; roofing, J. E. Riddell, 12 Ferguson avenue north; plastering, Hannaford Brothers, 232 Robinson street; plumbing and heating, Alexander McKenzie, 164 Wentworth street; iron stair, Canada Wire & Iron Goods Company, 182 King William street; painting and glazing, Goodale & Laidlaw, 20 Hunter street east; steel door and metal sash, A. Mathews, Limited, 256 Adelaide street west, Toronto; terrazzo, Italian Mosaic & Tile Company, 429 Spadina avenue, Toronto; W. J. Carmichael, Montreal, is the architect.

Niagara Falls, Ont.—The Canadian Bank of Commerce, Toronto, Ont., are erecting a bank building at Niagara Falls, and have awarded the plumbing contract to Sheppard & Abbott, 78 Harbord street, Toronto.

London, Ont.—The Bell Telephone Company, Montreal, are erecting a telephone building, and have awarded the following contracts: general contract, Pounder Brothers. Stratford, Ont.; heating and plumbing, Boxall & Mathie, Lindsay, Ont.; W. J. Marmichael, Montreal, is the architect, and I. J. McNab, Construction Department, Bell Telephone Building, Toronto, is the superintendent of construction.

Toronto, Ont.—The Canadian Housen Van Winkle Company, Morrow avenue, are erecting an office building, garage and residence at the corner of Morrow and Silver avenues, to cost $10,000, and their architect, F. S. Mallory, 65 Adelaide street east, has awarded the following contracts: steel, Hepburn & Disher, 18 Van Horne avenue; stone work, George Webb, 448 Summerhill avenue; brick and hollow tile, Don Valley Brick Works, Dominion Bank Building. The Bankers' Bond Company, Limited, 20 Victoria street, contemplates the erection of an office building on Bay street, to cost $20,000.

CIVIL ENGINEERING.

Ottawa, Ont.—A. E. Farley and J. H. Murphy, Banque Nationale Building, Ottawa, have been awarded the general contracts for the erection of a bridge for the County of Carlton.

Sandwich, West, Ont.—Ernest Renaud, Township of Sandwich, has been awarded the general contract for the erection of four bridges for the Township of Sandwich.

Toronto, Ont.—The Canadian Pacific Railway Company will erect a reinforced concrete viaduct over the Reservoir ravine, to cost $200,000.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Byron, Ont.—Architects Watt & Blackwell, Bank of Toronto Building, London, Ont., are preparing plans for a nurses' home for the Byron Sanatorium, to cost $25,000.

Hamilton, Ont.—Plans have been prepared for a theatre for MacKay Brothers, 104 Lister Building, to cost $20,000.

London, Ont.—The Hospital Commission of London, Ont., contemplates the erection of a soldiers' hospital, to cost $300,000. The Queen Alexandra Sanatorium contemplates the erection of a nurses' home.

Petrolia, Ont.—Architect J. M. Moore, 418 Richmond street, London, Ont., is preparing plans for a maternity hospital for the hospital trustees of Petrolia, to cost $10,000.

Toronto, Ont.—Architects Chapman & McGiffin, 95 King street east, have prepared plans for clubrooms for E. & R. Wood, Royal Bank Building, to cost $5,000.

FIRE LOSSES.

Bruce Mines, Ont.—The Post and Customs Offices and several general stores were destroyed by fire; loss $150,000.

Lanark, Ont.—The woollen mills of the Caldwell, Boyd & Company, Limited, were destroyed by fire; loss $150,000.

Langford, Ont.—The storage building of the Standard Chemical Company was destroyed by fire.

Montreal, Que.—A large storing warehouse of William Rutherford Lumber Company was destroyed by fire; loss $40,000.

Proton, Ont.—The barn and implement house of William Wright, 8th Concession, Proton, was destroyed by fire.

Regina, Sask.—The plant of the North Star Drilling Company, Regina, was destroyed by fire; loss $18,000. The plant of the Regina Storage and Forwarding Company was destroyed by fire; loss $27,000.

Sorel, Que.—The offices of the Canadian Steamships, Metropolitan Insurance Company, Sorel Newspaper Company, Bell Telephone Company, and the Dominion Government, at Sorel, were destroyed by fire.

Sterling, Ont.—The factory of the Sterling Cheese Box and Veneering Company was destroyed by fire.

St. Jacques L'Archigan, Que.—The parish church at St. Jacques L'Archigan was damaged by fire to the extent of $50,000

Thamesville, Ont.—The grain elevators of J. B. Stringer & Company and T. M. Syers & Son were destroyed by fire; loss $20,000.

Victoria, B.C.—The lumber mills of the Cameron Lumber Company were destroyed by fire; loss $100,000.

MISCELLANEOUS.

Belleville, Ont.—The City of Belleville contemplates the erection of bath houses at Victoria Park, to cost $5,000.

Blenheim, Ont.—The Pere Marquette Railway contemplates the construction of a reservoir.

Coniston, Ont.—Engineer W. L. Dethloff, Coniston, is preparing plans for a dry house for the Mond Nickel Company, Limited, Coniston, to cost $30,000.

Leamington, Ont.—Joseph Simpson, Talbot road, Rawleigh Township, contemplates the erection of a large barn.

London, Ont.—The London-Petrolia Barrel Company, London, are having plans prepared for a storage building and dry kiln of reinforced concrete; to cost $10,000.

London, Ont.—Beatty Brothers, London, Ont., are erecting a foundry and cupola building on York street, to cost $50,000, and their architect, Wm. G. Murray, Dominion Savings Building, has awarded the following contracts: general contract, John Putherbough, 1006 Wellington street; sheet metal, Fleming & Houghtby, 246 Talbot street, painting and glazing, George Howe, 427 Adelaide street.

Ottawa, Ont.—Thomas A. Stitt, Wellington street, will erect a garage on Wellington street, to cost $5,000.

Toronto, Ont.—The Imperial Munition Board, Imperial Life Building, will erect a garage on Dupont street, to cost $12,000, and their architect, J. B. Carswell, Imperial Munition Board, has awarded the general contract to the Dickie Construction Company, Ryrie Building.

Toronto, Ont.—Engineers Harkness & Oxley, Confederation Life Building, have prepared plans for a machine shop for John Inglis, 14 Strachan avenue, to cost $45,000. The Polson Iron Works, Toronto, will erect a boiler shop at the foot of Sherbourne street, to cost $60,000, and have awarded the general contract to McGregor & McIntyre, 1139 Shaw street, Toronto. The Consumers' Gas Company, 18 Toronto street, are erecting a booster house at Front and Parliament streets, to cost $10,000, and their architects, Burke, Horwood & White, Ryrie Building, have awarded the following contracts: concrete, Crescent Concrete Company, Temple Building, Toronto; roofing, G. Duthie & Son, 30 Widmer street, Toronto.

Toronto, Ont.—The Swift Canadian Company, St. Clair avenue, are erecting a fertilizer plant, stock pens and dressing rooms on St. Clair avenue, to cost $40,000, and have awarded the following contracts: roofing and waterproofing, Carmichael Waterproofing Company, 267 Delaware avenue, Toronto; plumbing, Sheppard & Abbott, 78 Harbord street; steel sash, Trussed Concrete Steel Company of Canada, Limited, 34 King street west, Toronto; the John V. Gray Construction Company, Confederation Life Building, are the general contractors. The Swift Canadian Company, St. Clair avenue, are erecting a cooler building on St. Clair avenue, to cost $150,000, and have awarded the general contract to Archibald & Holmes, Excelsior Life Building, Toronto.

Windsor, Ont.—Architect A. H. McPhail, Board of Trade Building, is preparing plans for an addition to a garage for the City of Windsor, on Pitt street east, to cost $17,000.

Windsor, Ont.—W. C. Kennedy, Chatham street west, Windsor, is erecting an auto service station at the corner of Chatham and Pelissier streets, to cost $46,000, and their general contractors, R. Westcott & Company, Chamber of Commerce Building, have awarded the electric wiring contract to McNaughton-McKay Company, Wyandotte street east; G. Jacques, Hydor Building, is the architect.

PLANTS, FACTORIES AND WAREHOUSES.

Bridgeburg, Ont.—The Genesee Pure Food Company, LeRoy, New York, will erect a factory at Bridgeburg, Ont., and have awarded the general contract to Alexander Shumway Utz & Company, Rochester, New York.

Chatham, Ont.—The Public Utilities Commission contemplates the erection of a cold storage plant.

Ford, Ont.—The Chalmers Motor Car Company, Detroit, will erect a factory on St. Lukes road, to cost $250,000.

Hamilton, Ont.—The Canadian Cotton Mills Company, McNab street, are erecting an addition to their factory on McNab street, to cost $60,000, and their architects, McPhie & Kelly, Bank of Hamilton Building, have awarded the following contracts: general contractor, G. E. Mills, 614 King street east: steel sash, A. B. Ormsby Company, Limited, 48 Abell street, Toronto, Ont.

Hamilton, Ont.—The Canadian Cotton Mills Company, MacNab street, are erecting an addition to their factory on MacNab street north, to cost $60,000, and their architects, McPhie & Kelly, Bank of Hamilton Building, have awarded the general contract to G. E. Mills, 614 King street east. The Canadian Westinghouse Company, Hamilton, are erecting a factory and office building on Langford avenue north, to cost $200,000, and have awarded the following contracts: plastering, Hannaford Brothers, 232 Robinson street; elevators, Otis-Fensom Company, 50 Bay street, Toronto; heating, Adam Clark, 7 Main street west; Prack & Perrine, Lumsden Building, Toronto, are the architects.

Harrow, Ont.—The Quality Canners, Limited, Harrow, are erecting a factory, to cost $35,000, and have awarded the mason contract to J. A. Secord, Harrow, Ont.

Kitchener, Ont.—The W E Woelfle Shoe Company, 127 Walnut street, are erecting an addition to their factory on Walnut street, to cost $8,000, and their architect, Charles Cowan, Victoria street, has awarded the following contracts: general contract, mason, carpenter work, concrete, plastering and roofing, H. Dunker & Son, Kitchener; plumbing, sheet metal and steel, Wm. Knell & Company.

London, Ont.—E. Leonard & Sons, York street, architects and owners, have prepared plans for an addition to their factory on York street, to cost $10,000, and have awarded the general contract to Harry Hayman, 491 Ontario street.

Montreal, Que.—The Canadian Cordage Company are erecting a warehouse on St. Patrick street, to cost $40,000, and have awarded the general contract to L. E. Dowling, 167 Yonge street, Toronto, Ont.

Niagara Falls, Ont.—The Herbert Morris Crane & Hoist Company, 79 Peter street, Toronto, are erecting a factory on Stanley street, to cost $80,000, and their engineers, Harkness & Oxley, Confederation Life Building, Toronto, have awarded the steel work contract to the Dominion Bridge Works, Toronto.

Saskatoon, Sask.—The Sawyer-Massey Company, Saskatoon, will erect a warehouse on First avenue north, and have awarded the general contract to James Priel, Saskatoon.

South Vancouver, B.C.—The Harvey Creosoting & Lumber Mills Company, South Vancouver, will erect a large electric plant, to cost $30,000.

Toronto, Ont.—The Willards Chocolate Company, Limited, 260 Spadina avenue, are erecting a factory on Wellington street west, and the general contractors, S. L. Yolles and Harry Rotenberg, 67 Baldwin street, have sub-let the following contracts: mason, Witchall & Son, 156 St. Helen's avenue; carpenter, Geo. L. Robinson, 107 Armstrong avenue; metal sash, A. B. Ormsby Company, Limited, 48 Abell street.

Toronto, Ont.—Roberts Brothers, 241 Dovercourt road, architects and general contractors, have prepared plans for a factory for W. J. Keens, 68 Spadina road, to cost $100,000, and have awarded the stone work contract to the Peerless Artificial Stone, Limited, Coxwell avenue. The B. F. Johnson Soap Company, 155 George street, are erecting a factory at the corner of Carlaw and Natalie streets, to cost $100,000, and their architects, Prack and Perrine, Lumsden Building, have awarded the mason and concrete contracts to John E. Russell, 30 Logan avenue, and P. H. Navin.

Toronto, Ont.—The Canadian General Electric Company, King and Simcoe streets, Toronto, are erecting a warehouse at the corner of King and Simcoe streets, to cost $100,000, and their architects, Burke, Horwood & White, Ryrie Building, have awarded the following contracts: mason, Holtby Brothers, Hepburne street; carpenter, George Sparling, 759 Dufferin street; roofing, A. Mathews, Limited, 255 Adelaide street west; steel sash, Steel & Radiation, Limited, Fraser avenue; painting, F. C. Davies, 218 Montrose avenue; plumbing, heating and sprinklers, Bennett & Wright, 72 Queen street east; plastering, R. C. Dancy, 153 Spadina road; elevators, Otis-Fensom Elevator Company, 50 Bay street.

PUBLIC BUILDINGS AND STATIONS.

London, Ont.—The Canadian Pacific Railway Company are preparing plans for rebuilding their station on Richmond street, at the cost of $15,000; M. Williams is the local superintendent.

Ottawa, Ont.—The Public Library Board of the City of Ottawa contemplates the erection of a branch library, to cost $15,000.

Sudbury, Ont.—The town of Sudbury has purchased a site at the corner of Elm and Lorne streets for the erection of a library building, to cost $15,000.

RESIDENCES, STORES AND FLATS.

Barrie, Ont.—A. L. McKinnon, Barrie, is erecting a residence on Bayfield street, to cost $5,000, and has awarded the following contracts: plastering, mason and carpenter, W. D. Minnikin; concrete, T. W. Tooke, Barrie.

Brantford, Ont.—The Soldiers' Aid Society, of Brantford, contemplates the erection of a permanent home for the returned soldiers.

Ford, Ont.—Architects G. Jacques & Company, Hydro Building, Windsor, are preparing plans for a bungalow for C. T. Montreuil, Ford, Ont., to cost $8,000.

Hamilton, Ont.—The Crafton & Company, James street north, are erecting a department store on James street north, to cost $100,000, and their architect, G. J. Hutton, Bank of Hamilton Building, has awarded the following contracts: electric work, J. Dynes, 28 Avalon place; sprinkler system, Adam Clark, 7 Main street east; tile and marble, Kent, Garvin & Company, Catharine street. Architect F. W. Warren, Bank of Hamilton Building, has prepared plans for a residence for Henry Dunham, Cannon street east, on Main street east, to cost $5,000.

Hamilton, Ont.—Dr. O. W. Neimer, 412 Barton street east, is erecting a residence on Sherman avenue north, to cost $12,000, and his architect, G. J. Hutton, Bank of Hamilton Building, has awarded the following contracts: sheet metal and roofing, Dennis & Jocelyn, 13 Walnut street; electric wiring, J. Dynes, 20 Avalon place; painting and glazing, P. Thompson, 13 Walnut street north. Dr. Stewart, Beach street, is erecting a residence at the corner of Proctor and Main streets, to cost $7,000, and his contractor, John Poag & Company, Westinghouse avenue, has sub-let the following contracts: plastering, Hill Brothers, 307 Emerald street north; electric wiring, J. Dynes, 20 Avalon place Architects Scott & Wardell, Sun Life Building, are preparing plans for a residence for the Pattison estate, on the corner of Park and King streets, to cost $15,000. J. W. Gathercole, 439 King street west, will erect an apartment house on King street west, to cost $11,000, and has awarded the following contracts: general contract, G. E. Gaylord, 54 Lamoreaux street; carpenter, Mr. Wyer, Chatham street.

London, Ont.—Mr. P. Gray, 198 York street, will erect a residence on York street, to cost $6,000, and has awarded the general contract to Harry Hayman, 490 Ontario street.

Monteith, Ont.—The Provincial Department of Public Works, Parliament Buildings, Toronto, Ont., will erect a men's residence at Monteith, to cost $26,000, and has awarded the general contract to Jeffrey & Stevens, North Bay.

Ottawa, Ont.—The Brown Estate are erecting an apartment house on Laurier avenue, to cost $49,000, and their architects, Richards & Abra, 126 Sparks street, have awarded the following contracts: carpenter, A. Richards & Company, Ottawa; marble and tile, A. K. Mills & Son, 191 Sparks street; plastering, Murphy & Morrow, Billings avenue; painting and glazing, Ritchie & Nunn, 280 Sunnyside avenue; electric wiring, J. E. S. Lewis, Ottawa; plumbing and heating, W. G. Edge, Booth Building.

Ottawa, Ont.—Leon Petergorsky, 351 Chapel street, is erecting an apartment house at Ottawa, to cost $25,000, and has awarded the following contracts: electric wiring, Marchand & Donneley, 128½ Sparks street; heating and plumbing, Coldrey & Chapman, 330 Rideau street. Major McKeen, Ottawa, is erecting a residence on Buena Vista road, to cost $11,000, and his architects, Millison & Burgess, Union Bank Building, have awarded the following contracts: plastering, Murphy & Morrow, Billings avenue; painting and glazing, G. T. Greene, 792 Bank street; heating and plumbing, Coldrey & Chapman, 330 Rideau street. James & Kent, Castle Building, have commenced work on alterations to an apartment house for Dr. J. F. Argue, 1890 O'Connor street, to cost $16,200; Taylor & Horwood, Castle Building, are the architects.

Ottawa, Ont.—G. D. Findlayson, 479 Slater street, is erecting a residence on Carling avenue, to cost $10,000, and has awarded the following contracts: general contract, G. A. Crain, 285 Clenow avenue; plastering, Frank Hunt, 115 Arlington street; painting and glazing, Ritchie & Nunn, 280 Sunnyside avenue; heating and plumbing, Hallaway & Son, 373 Somerset avenue. The general contractors, Taylor & Lockey, 23 First avenue, are excavating for an apartment house for the Brown Estate, on Laurier avenue north, to cost $49,000; Richards & Abra, 126 Sparks street, are the architects. W. G. Smith, 465 Somerset street, is erecting an apartment house on Somerset street, to cost $11,000, and has awarded the following contracts: general contract, N. Hollister, 512 Bay street; plastering, Murphy & Morrow, 498 Cooper street; painting and glazing, A. J. Moore, 80 Flora street; electric wiring, Stanley Lewis, 817 Lyon street; heating and plumbing, J. T. Blyth, Frank street. George Crain, 285 Clenow avenue, general contractor and owner, is erecting an apartment house on Nepean street, to cost $18,000, and has awarded the following contracts: plastering, Murphy & Morrow, Ottawa; painting and glazing, G. H. Higman & Son, 176 Rideau street; heating and plumbing, J. T. Blyth, Frank street.

Renfrew, Ont.—T. A. Low, Renfrew, Ont., is erecting a residence at the corner of Stewart and Bruce streets, to cost $10,000, and their architect, W. E. Noffke, Central Chambers, Ottawa, has awarded the plumbing and heating contract to W. A. Derry, Patrick street, Renfrew.

Toronto, Ont.—Plans have been prepared for a residence for C. Gardner, 3 Northcliffe avenue, to cost $5,000. Architect W. Bredin Galbraith, Excelsior Life Building, is preparing plans for a residence to be erected on the west bank of the Humber river, south of Bloor street, to cost $5,800. Architect P. H. Finney, 79 Adelaide street east, is preparing plans for an apartment house for himself on Roncesvalles avenue, to cost $25,000. Robert Brothers, 241 Dovercourt road, are erecting an apartment house at the corner of Roxton and Arthur streets, to cost $60,000, and have awarded the electric wiring contract to George Armstrong, 1217 College street.

Toronto, Ont.—W. H. Cawthra, 60 Forest Hill road, is making an addition and alteration to his residence, at the cost of $11,000, and his architects, Eden Smith & Sons, 33 Scott street, have awarded the following contracts: mason, T. & A. G. Ham, 83 Salem avenue; roofing, G. M. Bryan, 503 Yonge street; carpenter, Robinson & Wilson, 34 Alcina avenue; plastering, W. H. Little, 62 Tranby avenue; painting, F. G. Roberts & Company, 106 Wells street; wiring, R. A. L. Gray & Company, 85 York street; plumbing, Fiddes & Hogarth, 122 King street east; heating, Jos. Morrison, 8 St. Mary street; hardware, Canada Hardware Company, Limited, 39 Richmond street east.

Toronto, Ont.—T. J. Medland, 130 King street east, will erect a residence on Keele street, to cost $18,000, and his architect, J. A. McKenzie, Lumsden Building, has awarded the following contracts: mason, Wm. Edwards, 337 Rusholme road; carpenter, John Lambert, 312 Westmoreland avenue; plastering, Taylor & Nesbitt, 18 Havelock street; plumbing, McNaughton & McKenzie, 1029 Shaw street; painting and glazing, F. G. Roberts Company, 106 Wells street; electric wiring, W. H. Douglass, Toronto. Architects Ellis & Ellis, Manning Chambers, are preparing plans for a residence for C. M. Hall, 245 Glendonwynne road, on Glendonwynne road, to cost $7,000. The Standard Reliance Mortgage Company, 84 King street east, will erect two pairs of residences on Maughan crescent, to cost $10,000. Architects Wickson & Gregg, Kent Building, are preparing plans for an alteration to the residence of Sir J. C. Eaton, Davenport road, to cost $5,000. Jas. McKenzie, 53 Lyndhurst avenue, has had plans prepared for a residence on Lyndhurst, to cost $5,000.

Windsor, Ont.—Jos. Major, 640 Peter street, has commenced work on a duplex residence on Pelissier street, for W. Turner, 91 Oak street, to cost $5,500. B. Mechanic, 102 Mercer street, has commenced work on a store and flat building, on Windsor avenue, for H. Croll, 107 Glengary street, to cost $5,000.

SCHOOLS, CHURCHES AND COLLEGES.

Agincourt, Ont.—The Anglican Church of Agincourt contemplates the erection of a church. Robert Oakley is the trustee.

Hamilton, Ont.—The Ruthenian Church, Gray street, are erecting a church on Gray street, to cost $16,000, and has awarded the general contract to R. A. Nicholson, 47 Dundurn street north.

Hamilton, Ont.—The Board of Education, City Hall, is erecting an eight-room school on Beach road, to cost $70,000, and has awarded the following contracts: mason and concrete, W. H. Cooper, Clyde Block; carpenter, George F. Smith, 20 Carrick avenue sheet metal and roofing, Dennis & Jocelyn, 13 Walnut street; steel, Canada Wire & Iron Goods Company, King William street; plastering, Hannaford Brothers, 232 Robinson street; painting and glazing, Dobson & Company, 121 Victoria avenue; electric wiring, Culley & Breay, 35 King street west; heating and plumbing, Adam Clark, 7 Main street; tile work, Kent, Garvin & Company, 20 Catherine street north; Stewart & Witton are the architects.

London, Ont.—The City of London contemplates the erection of a vocational school in connection with the Bryon Sanatorium.

Ottawa, Ont.—The Public School Board of Ottawa is erecting an addition to Bolton Street School, and has awarded the general contract to A. I. Garvock, 136 Lewis street; W. B. Garvock, Superintendent of Buildings, Creighton Street School, is the architect.

Ottawa, Ont.—Architects Millison & Burgess, Union Bank Building, are preparing plans for a presbytery for the St. Thomas Aquinas Parish, Billings Bridge, to cost $7,000. Architects Millison & Burgess, Union Bank Building, are preparing plans for a presbytery for the Blessed Sacrament Church, Fourth avenue, to cost $10,000.

Schumacher, Ont.—The Public School Board of Schumacher is erecting a school, to cost $18,000, and has awarded the general contract to Hill, Clark, Francis, Limited, Timmins, Ont.; J. P. MacLaren, 104 Sparks street, Ottawa, is the architect.

Stratford, Ont.—The Central Methodist Church are erecting an addition to their church and Sunday-school, to cost $17,000, and their architect, A. G. Garner, Box 232, Stratford, has awarded the following contracts: general contract, A. G. Everett, 51 Chestnut street; steel, Stratford Bridge & Iron Company, Erie street; plumbing, J. R. Myers & Son, 99 Ontario street; plastering, W. Soeder, 210 Huron street.

Toronto, Ont.—Architect H. F. Secord, 2 College street, has prepared plans for an addition to the Royal College of Dental Surgeons, College street, to cost $25,000.

Toronto, Ont.—The Separate School Board, 67 Bond street, are erecting a school at the corner of Roncesvalles and Westminster avenues, to cost $20,000, and their architect, C. J. Read, Confederation Life Building, has awarded the following contracts: mason, John McGlue, 285 Sherbourne street; concrete, Queen City Concrete Paving Company, 179 Broadview avenue; steel, Reid & Brown, 63 Esplanade street east; carpenter, Madden Brothers, 552 Adelaide street west; painting and glazing, M. J. Phelan, 133 Queen street east; plastering, Taylor & Nesbitt, 18 Havelock street; sheet metal and roofing, H. W. Pask, 49 Concord avenue; electric wiring, Canada Electric Co., 183 Church street; heating, plumbing and gas fitting, T. Regan, Toronto.

Trenton, Ont.—Architects S. A. Coon & Son, Excelsior Life Building, Toronto, are preparing plans for an addition of four rooms to Dufferin Avenue School, for the Public School Board of Trenton, Ont., to cost $30,000.

Yarmouth Township, Ont.—The general contractors, Horton Brothers, St, Thomas street, have commenced work on a church for the Anglican Church, to cost $5,500; E. Horton, 84 Myrtle street, St. Thomas, is the architect.

Yarmouth Township, Ont.—The Anglican Church, Synod of Huron, are erecting a church, to cost $5,500, and their architect, E. Horton, 84 Myrtle street, St. Thomas, has awarded the following contracts: general contract, Horton Brothers, St. Thomas, Ont.; heating and sheet metal, W. H. Bradley, 66 Ross street; electric wiring, Roberts & Sandham, 521 Talbot street; carpenter, D. F. Shafter & Company, 131 Curtis street; painting, Jos. Newbury.

Windsor, Ont.—The Holy Trinity Church contemplates the erection of a church on Hall street, to cost $25,000; A. H. McPhail, Board of Trade Building, is the architect.

CONTRACTS BETWEEN ARCHITECTS AND CLIENTS.

The statement has frequently been made that fewer than ten per cent. of the agreements under which architects render professional services are expressed in writing. Such a condition, if it exists, is not only one of danger, but it seems to indicate lax business methods. Certain it is that cases in which architects have undertaken important work on mere verbal orders are numerous, and not infrequently the resulting misunderstanding has occasioned loss to one party or the other. A number of these in which there appeared serious disagreements have been submitted to the courts for adjudication. A case decided in February of this year by the Supreme Court of Minnesota only illustrates again the unwisdom of trusting to memory or the ability to establish the terms of an agreement without a written document. In this instance the owner admitted that he had employed the architect to make sketches for the structure, but denied that he had entered into a definite arrangement with him to make working plans and specifications and to superintend the construction of the building. The architect, on the other hand, claimed that he was regularly employed to render complete architectural services, and entered suit on that basis. In deciding against the architect the court held that when it is understood between the parties that the entire agreement is to be put in writing, the fact that it was never written out and executed is strong presumption of no contract at all; that the writing of the contract is a condition precedent to its completion.

It seems to be a usual practice for the average architect to enter into a mere verbal agreement with an owner to prepare sketches and procure preliminary estimates for a building. At a subsequent interview, perhaps, he will agree to proceed to another stage and prepare working drawings and specifications, and procure actual estimates. At a later time the owner may possibly instruct him to let contracts and supervise the work. When the work is finally completed, or even if the operation is halted at any one of the successive stages, it is frequently difficult to establish the basis upon which the work has been done. In fact, it is this loose and haphazard method of agreement between architect and owner that leads to a majority of the misunderstandings and resulting suits at law by which architects endeavor to secure compensation for services rendered. A definite understanding and written agreement before any work is undertaken, with supplemental modifications, additions, or revisions mutually agreed upon as occasion arises, would prevent these disputes or render their determination comparatively simple and inexpensive. It is to be hoped that architects will soon come to a realization of this fact in the interest not only of their own incomes, but as a measure that will result in better feeling on the part of the public, and a higher regard in general for the architect's business ability.—The American Architect.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings
Featured in This Issue

Administration Building, Board of Education, Toronto.

Ash Hoists, W. D. Beath & Son.
Boilers, Jenckes Machine Co.
Brick, Exterior, Don Valley Brick Works.
Brick, Fancy, Don Valley Brick Works.
Brick, H. N. Dancy & Son.
Carpentering Work, F. Armstrong.
Carpets and Rugs, T. Eaton Co.
Casements, Trussed Concrete Steel Co.
Chimneys, Dominion Bridge Co.
Doors, Batts, Limited.
Electric Contractor, A. R. Rice & Co.
Electric Fixtures, McDonald & Willson.
Elevators, Otis-Fensom Co.
Expanded Metal, Pedlar People.
Fire Doors, W. E. Dillon Company.
Fire Escapes, Canadian Ornamental Iron Co.
Flooring, Terrazzo, Venetian Mosaic & Tile Co.
Furniture, Office Specialty and Charles Rogers & Sons.
Glass, Consolidated Plate Glass Co.
Hardware, Jobbers, Aikenhead Hardware Co.
Hardware, Yale & Towne.
Heat Regulators, Johnson Temperature Regulating.
Hollow Tile, Don Valley Brick Works.
Interior Woodwork, D. Springman.
Kitchen Equipment, Gurney Foundry Co.
Marble, Canadian Glass Mantle & Tile Co.
Motors, Canadian Blower Co.
Ornamental Iron, Canadian Ornamental Iron and Luxfer Prism Co.
Plaster, A. D. Grant.
Plumbing Fixtures, Cluff Bros. and Imperial Products Co.
Pumps, Darling Bros.
Radiators, Dominion Radiator Co.
Reinforcement, Trussed Concrete Steel Co.
Roofing, W. E. Dillon Co.
Stone, John Vokes.
Structural Iron, Dominion Bridge Co.
Telephone Equipment, Bell Telephone Co.
Tile, Canada Glass Mantle & Tile.
Vaults, Goldie & McCulloch.

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Ash Hoist, Turnbull Elevator Manufacturing Co.
Blackboards, Geo. M. Hendry Co., Ltd.
Boilers, John Inglis Co.
Brass Railing, Toronto Brass Mfg. Co.
Brick Contractor, R. Robertson & Son.
Brick, Exterior, John Price.
Brick, Fancy, Don Valley Brick Works.
Carpenters, Crocker & Ledrew.
Cement, Canada Cement Co.
Coal Chute, Canadian Ornamental Iron Co.
Concrete Work, A. C. Richmond.
Desks, Canadian Office & School Furniture Co.
Doors, Batts, Limited.
Electric Contractor, Fred Armstrong Co.
Electric Panel Boards, Trumbull Vanderpool Elec. Mfg. Co.
Expanded Metal, Pedlar People.
Fire Alarm System, Northern Electric Co.
Fire Doors, D. M. Rowe.
Fire Extinguishers, Booth-Coulter Co.
Fire Hose, Dunlop Tire & Rubber Goods Co.
Flooring, Concrete, A. C. Richmond.
Flooring, Terrazzo, Mississiqui Lautz Co.
Furniture, N. S. Houghton, G. L. Reynolds. T. Eaton Co., R. Simpson Co., Adams Furniture Co., Grand & Toy, Art Metropole, Geo. M. Hendry Co., Office Bureau Co., L. S. Levinter.
Glass, Consolidated Plate Glass Co. and Luxfer Prism Co.
Hardware, Jobber, Vokes Hardware Co.
Hardware, Toronto Lock Mfg. Co.
Hose Reels, Wilson & Cousins.
Heat Regulators, Johnson Temperature Regulating Co.
Kitchen Equipment, Geo. Sparrow & Co.
Laboratory Equipment, N. S. Houghton.
Marble, Canadian Glass Mantle & Tile Co.
Moving Picture Machine, Spencer Lens Co., Buffalo, and Victor Animatograph Co., Davenport, Iowa.
Ornamental Iron, Shipway I., B. & W. Co.
Paints, Andrew Muirhead Co.
Paint Contractor, James Phinnemore.
Plaster Contractor, James A. Berridge.
Plumbing Contractor, Purdy, Mansell & Co.
Plumbing Fixtures, Cluff Bros.
Pumps, Bawden Machine Co.
Radiators, Gurney Foundry Co.
Roofing, Cruise Bros.
Seating, Berlin Interior Hardwood Co. and Canadian Office & School Furniture Co.
Stone, Indiana Limestone, Ohio Sand Stone.
Structural Iron, Dominion Bridge Co.
Telephone Equipment, S. H. Couch Co., Boston, Mass.
Traps, C. A. Dunham Co.
Ventilators, Canadian Blower Co.

Aberdeen School, Moncton, N.B.

Blackboards, Slatington Blackboard Co.
Boiler Feed Pump, Smart Turner Co., Hamilton.
Boilers, Taylor Forbes Co.
Cast Iron Soil Pipe, Thomas Robertson Co., Montreal.
Cement, Canada Cement Co.
Desks, Canadian Office & School Furniture Co.
Electric Contractor, Perry Bros., Moncton.
Expanded Metal, Pedlar People.
Fire Alarm System, Holtzer-Cabot Co.
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Plumbing Fixtures, James Robertson Co.
Plumbing, Hagen & Co., Amherst.
Radiators, Taylor Forbes Co.

Stone, Sackville Freestone Co.
Structural Iron, Maritime Bridge Co.
Terra Cotta, Atlantic Terra Cotta Co., New York.
Varnish, Pratt & Lambert, Buffalo.
Ventilators, B. F. Sturtevant Co. of Canada.
General Contractor, Paul Lea Co., Moncton.

Cote Des Neiges School, Montreal.

Brick, Exterior, National Brick Co. of Laprairie and E. Rochefort.
Doors, W. J. O'Leary & Co.
Floor Reinforcing, Canadian Seigwart Beam Co.
Heating Engineers, T. Lessard & Sons.
Lumber, British Columbia.
Marble, Smith Marble & Construction Co.
Plumbing, T. O'Connell.
Stone, C. Piche, Montreal.
Structural Iron, Phoenix Bridge & Iron Works.
Terra Cotta, Montreal Terra Cotta Co.
Tile, Smith Marble & Construction Co.
Traps, C. A. Dunham Co.
General Contractor, E. N. & U. Boileau.

Beamsville High School.

Boilers, Spencer Heater Co. of Canada, Ytd.
Brick, Exterior, Milton Pressed Brick Co.
Brick, Sun Brick Co.
Expanded Metal, Pedlar People.
Glass, Leeks & Potts Co.
Heating Engineers, A. Rodgers & Co.
Hardware, Rice, Lewis & Co.
Hollow Tile, Sun Brick Co., Ltd.
Interior Woodwork, J. A. Hewitt, Beamsville.
Plumbing, A. Rodgers & Co.
Radiators, Steel & Radiation.
Stone, Queenston Quarries.
Structural Iron, Toronto Structural Iron Co.
General Contractor, Duncan Mavor, Beamsville.

Galt Public School.

Blackboards, North Bangor Slate Co., Bangor, Pa.
Boilers, Goldie & McCulloch Co.
Brick, Milton Pressed Brick Co.
Cement, Canada Cement Co.
Electric Contractor, Scott & Bennett.
Expanded Metal, Metal Shingle and Siding Co.
Flooring, Hardwood, J. R. Eaton Co.
Hardware, Jobber, Aikenhead Hardware Co.
Heaters, Sheldons, Limited.
Heating Contractors, Geo. E. B. Gringer Co.
Heat Regulators, Johnson Temperature Regulating Co.
Hollow Tile, National Fireproofing Co.
Hose Reels, Wilson & Cousins.
Interior Woodwork, Georgian Bay Shook Mills.
Ornamental Iron, Canada Wire & Iron Goods Co.
Plumbing Fixtures, Taylor & Brown.
Pumps, McDougall Co., Galt.
Radiators, Dominion Radiator Co.
Reinforcement, Trussed Concrete Steel Co.
Roofing, Paterson Mfg. Co.
Stone, A. & E. Nobs Co., London.
Structural Iron, Dominion Bridge Co.
Varnish, Pratt & Lambert.
Ventilators, Sheldons, Ltd.
General Contractor, P. H. Secord & Sons.

Sarnia Public School.

Blackboards, Turnbull & Cutliffe.
Boilers, Weil Boiler Co.
Brick, Exterior, Milton Pressed Brick Co.
Casements, Trussed Concrete Steel Co.
Cement, Ontario Blue Lake Cement Co.
Desks, Globe Furniture Co.
Electric Contractor, Mackenzie Electric Co.
Flooring, Terrazzo, Italian Mosaic & Marble Co.
Floor Reinforcing, Trussed Concrete Steel Co.
Glass, Pilkington Bros.
Hardware, Aikenhead Hardware Co.
Heat Regulators, Powers Regulator Co.
Hollow Tile, National Fireproofing Co.
Interior Woodwork, Shultz Bros. Co.
Marble, Adamson Marble Co.
Ornamental Iron, W. D. Beath & Son.
Plaster, Hewitson & Potter.
Plumbing, Anguish & Whitfield.
Plumbing Fixtures, Imperial Products, Ltd.
Radiators, American Radiator Co.
Stone, Central Canada Stone Co.
Structural Iron, Sarnia Bridge Works.
General Contractor, Shultz Bros. Co.

Brighton School, Brighton, Ont.

Blackboards, Lehigh Structural Slate Co.
Boilers, Dominion Radiator Co.
Brick, Sun Brick Co.
Hardware, Rice Lewis & Co.
Hollow Tile, Sun Brick Co.
Plumbing Fixtures, Imperial Products, Ltd.
Radiators, Dominion Radiator Co.
Stone, John Vokes and Cement Products Co.
Structural Iron, McGregor & McIntyre.
Telephone Equipment, Stromberg Carlson Co.
Vacuum Cleaners, Tuec Co.
Varnish, International Varnish Co. a
General Contractors, Dickie Construction Co.

◆

HOLT ROOF VENT CONNECTIONS.

The Paterson Mfg. Co., manufacturers of Barrett Specification roofing, have issued a booklet describing an improved line of roof leader and vent connections. The Holt connection, with its roof lock-fittings and its very important expansion-joint feature, is an ideal device, and will prevent leaks around outlets due to settling of roof-deck caused by shrinkage or settlement, or expansion and contraction in the leader-lines, and by entirely eliminating sheet-metal outlet-boxes it does away with the collapsing, condensation and leaks characteristic of that form of outlet. Its series of three gravel stops entirely prevent any loose gravel, leaves or roof rubbish from washing into and clogging the down-spout.

The connection is made entirely of copper and cast iron, and therefore it insures service as lasting as any part of the roof and provides a flexible connection, made possible by an expansion-joint fitting which is entirely lacking in any other form of roof or leader-connection. The outlet is also made integral with the roof-deck by means of a lock-fitting which entirely prevents any strain or movement at the roof-line.

It is designed for use with any kind of flat or nearly flat roof construction—gravel, metal, inlaid slate, tile or felt—and for any place where vent-pipes, leader-lines, steam-stacks, flagpoles—in fact, any fixtures passing through the roof—require flashing.

◆

MATERIAL SALESMEN VALUABLE TO ARCHITECTS.

To know that his architect subscriber considers the advertising pages of his architectural publication a vade mecum and a "compendium of useful knowledge" regarding all materials and appliances usable in his work may be very satisfactory to the publisher, but he is more satisfied when the advertisement prompts the architect to investigate the peculiar attributes of the advertised article so that he can apply it to that use most fitting to a particular design. It is not always possible to examine the material or appliance advertised in place or operation, or even on exhibition, but with a systematized business there is always time to converse with the intelligent salesman when he calls. Too few architects recognize the value of such interviews and their direct relation to the duty of giving the best service possible to the client. In this country, where the architect definitely specifies the material, and at whose dictum, rather than that of the paying owner, it is installed, this gathering of a detailed knowledge of materials is as important as the designing of stable construction. Even more so, because the contractor or superintendent can catch an apparent instability in plan, while the material once specified, only a superficial inspection of its quality, and none of its comparative fitness to the particular purpose is probable after it is specified. Thus the granting of a thorough interview to a salesman is as much a part of the day's work as an inspection and checking up of the plans going through the drafting room. New materials and new methods are evolved daily, and as just as rapid changes are taking place in design, a thorough knowledge of those materials most adaptable to the design is indispensable to the progressive architect. The advertising pages of his architectural journal furnish the information regarding the main qualities and purpose of a material, from which can be surmised its fitness to a particular purpose. The salesman gives the detailed information, and an inspection of the article itself decides the matter. The knowledge gained is in the direct interest of the client, and therefore has a direct influence on the reputation of the architect for capability in his community. The reputation of Dankmar Adler was based as much upon his intimate knowledge of materials and appliances as that of his genius for construction, and he acquired much of this knowledge from the expert representatives of manufacturers of materials.—The Western Architect.

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CONSTRUCTION

August, 1917 Vol. 10, No. 8

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Full Page Illustrations

NORTH TORONTO MILITARY ORTHOPEDIC HOSPITAL (Frontispiece).. 256

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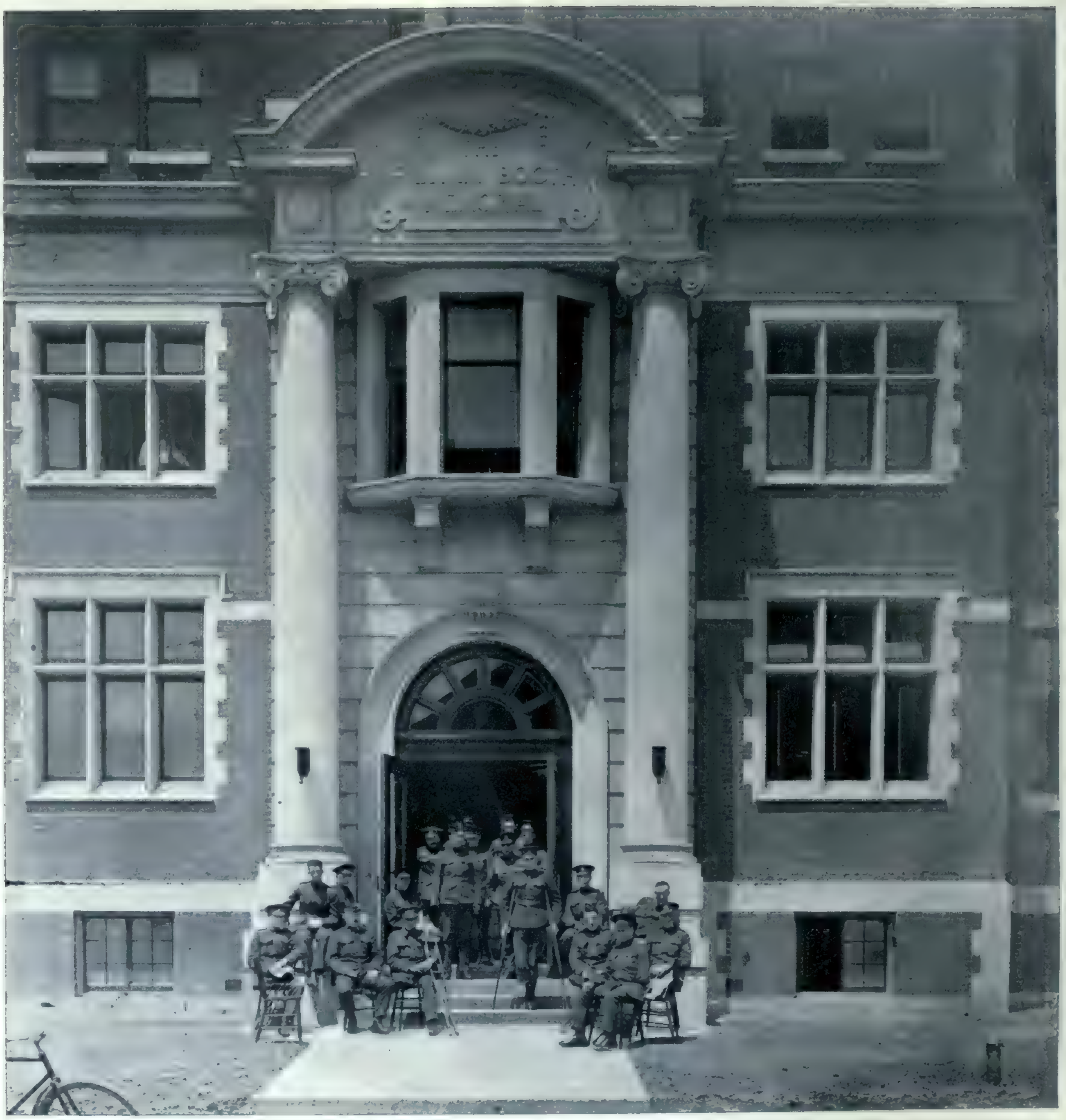


NORTH TORONTO MILITARY ORTHOPEDIC HOSPITAL, ORIGINALLY ERECTED BY THE SALVATION ARMY AS A TRAINING SCHOOL AND TAKEN OVER BY CANADIAN MILITARY HOSPITALS COMMISSION WHEN THE CALL CAME TO PROVIDE HOSPITAL ACCOMMODATION MORE QUICKLY THAN NEW BUILDINGS COULD BE CONSTRUCTED.

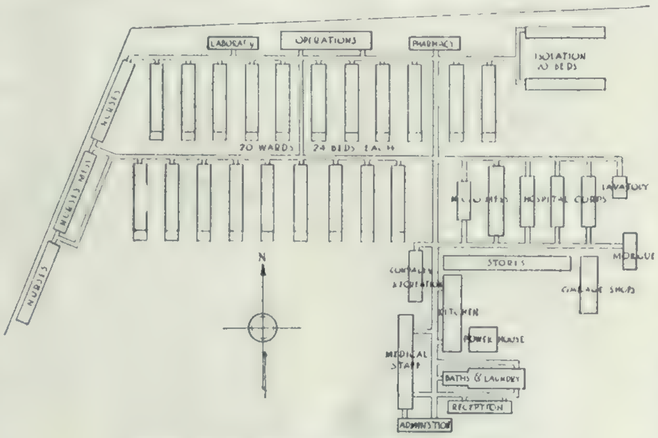
Plans and Construction of Military Hospitals

United States Architect Who Assisted in the Erection of Military Hospitals in France Outlines Plans Adapted to American Requirements

By Charles Butler, in "Architectural Forum."

"WAR HOSPITAL" covers a multitude of varying types of building with varying destinations, from the hole in the ground in the front line trench to the great physical re-education centres in the rear, and includes canal boat, railroad train hospitals, hospitals for contagious diseases, rest camps, etc.

The hospitals, however, to which I refer especially in the present article, are those for the general care of wounded and sick, and it may, perhaps, be easiest to classify them by their geographical relation to the front. I speak, I may say, entirely of the French front, as my experience at the British front is extremely limited.



Plan for 500-Bed Base Hospital, Vincennes, Paris, France

I should perhaps preface my remarks with an explanation of just what my relation to the French army was, and how I happened to have the opportunity to gain some knowledge of French war hospitals.

As a member of the American Relief Clearing House I was at work in Paris in the fall of 1915, when Dr. Carrel, who knew of my having made a special study of hospital planning in America, asked me to prepare for him the plans for a small 100-bed unit, to be erected closer to the front than his hospital at Compiègne, then under shell fire and likely to be evacuated any day.

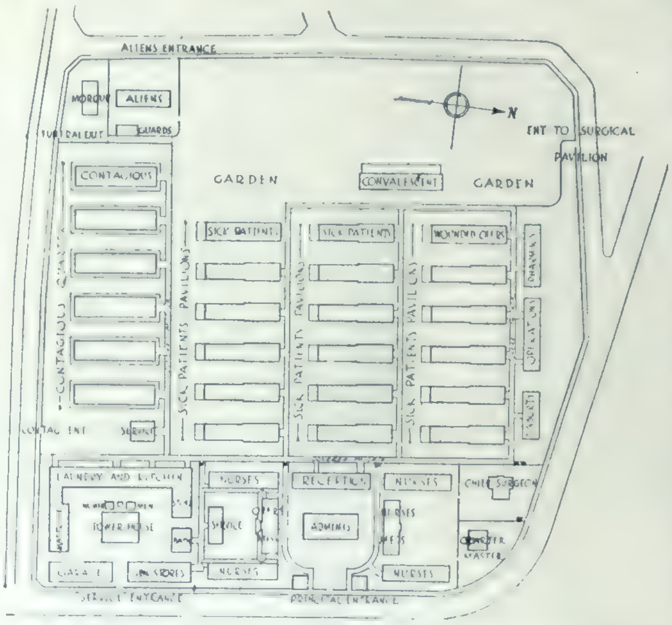
Administration difficulties in regard to the admission of foreign nurses to the advanced zone of the army prevented the erection of this hospital, and the destruction of the 380 mm. gun which was shelling Compiègne ended the necessity of evacuating, so the project was dropped; but the Deputy Minister of War in charge of the Medical Service (there are three assistant Ministers of War in France for Munitions, Supplies and Medical Service) expressed his interest in the plans and asked me to bring them to him. It turned out that it had been planned to hold a competition for a model portable house type of hospital to be erected near Paris and to serve as a type for future base and home hospitals; but after looking over our plans the minister remarked that a competition did not seem necessary, and I volunteered my services to work out this model plan. A very excellent site was selected just outside the Bois de Vincennes, the great park to the east of Paris corresponding to the Bois de Boulogne on the west. At my request, M. Pellechet, a former fellow student at the Ecole des Beaux Arts, was to his considerable annoyance dug out of his second line trench and brought back to help me on the work. Dr. Dumont, a prominent young civilian surgeon, similarly mobilized for the war, was shortly after added to our combination, and we three working together have since very considerably influenced the design of French war hospitals.

All France is divided into two parts, the army zone—and the rest. The zone is a strip, on the average, thirty miles wide, parallel to the front, into which one only penetrates by the permission of the Grand Quartier Général. In this zone lie the front line hospitals, ambulances, dressing stations, etc.

The grouping of these services is about as follows: In the front line trench is what is known as the *Abri du Blessé*, a hole in the side of the trench, where the wounded man is put to get him as much as possible out of danger till he can be moved to the advanced dressing stations which lie fifty yards or so behind the front line trenches. This dressing station, or *poste de secours*, is presided over by an assistant surgeon, probably a medical student when war began. From the dressing station, which is always underground and contains perhaps a dozen bunks, the wounded man is transported, as soon as the firing slackens sufficiently, through the *boyau*, or communication trench (*boyau* means bowel, and the convolutions of the communication trench for the purpose of localizing the effect of bursting shells fully justify the name), back to the battalion dressing station, perhaps a mile away.

You can imagine just how painful is the trip through this mile of winding trench. Various types of stretchers are used, perhaps the most satisfactory being the hammock stretcher hung from a pole carried on the shoulders of the bearers and more easily manœuvred in the winding trench than the ordinary side pole stretcher. There are also chair stretchers for seated cases, etc.; but any way you take it, it is a hard trip for a wounded man. At the battalion dressing station is a full fledged surgeon and there are facilities for operating—as always underground. This dressing station is generally accessible for motor ambulances, at least at night.

The advanced dressing station is located so that one end is in direct communication with the *boyau* through which the wounded are transported. It is underground and fairly heavily protected, and contains beds in two tiers, with a small space at one end for emergency dressings and stores. The wounded reach this post in about six minutes, and from there are carried in ordinary stretchers about a mile to the end of the military road, the farthest point to which ambulances can go.



Permanent Military Hospital at Issy les Moulineaux, France

These subterranean posts are made about ten feet wide at the ceiling, with walls of planks sloping slightly in toward the floor. Log posts support the roof, and are spaced about every five feet.

The lower beds are for the more seriously wounded, the upper ones for slightly wounded. The former are removable for cleaning; the latter hinged at one end to allow swinging for cleaning. The construction of the roof is interesting in showing the provision made for exploding shells. An explosion chamber is built immediately above the ceiling over one layer of logs. Above the chamber there are generally at least four layers of logs, each layer placed crosswise of the preceding one, and large stones and earth above these to a depth of at least five feet. For absolute protection against shells up to and including 220 mm., experience has shown that fifteen feet should be provided. Against 380 mm. and 420 mm. shells, experience has as yet shown no satisfactory method of insuring protection.

The battalion dressing stations are located underground and heavily protected from shell fire. They contain an operating room at one extremity, provided, as always, with two exits. Beds in two tiers accommodate about twenty-four wounded. Living quarters for orderlies, surgeons, etc., are provided above ground. The wounded from the advanced stations arrive here in about one hour from the front.

The next station, called an ambulance, is located about two miles from the front, and comprises a number of buildings underground. The operating room is about eight by seventeen feet, with an arched roof of corrugated steel, the crown of which is about seven feet four inches above the floor. The haunches of the arch are filled with earth up to the level of the crown, above which is a thin layer of cement and a course of tree trunks about eight inches in diameter. Above these is the first explosion chamber, about twenty inches high, again two or three courses of logs, another explosion chamber and additional logs covered with earth and rocks, making a total thickness from crown of arch to the surface of about twelve feet.

The explosion chambers are designed to counteract the effect of the type of high explosive shells which are fitted with a delayed fuse that, ignited by impact, allows the shell to penetrate the earth before exploding.

The operating room is reached by a *boyau* leading from an examination room, also underground, with heavy protection, and placed at the edge of the road by which the ambulances arrive. From the operating room another *boyau* continues to a waiting space, where, after having their wounds dressed, those who are to go to the hospitals can wait in security for the ambulances to carry them away.

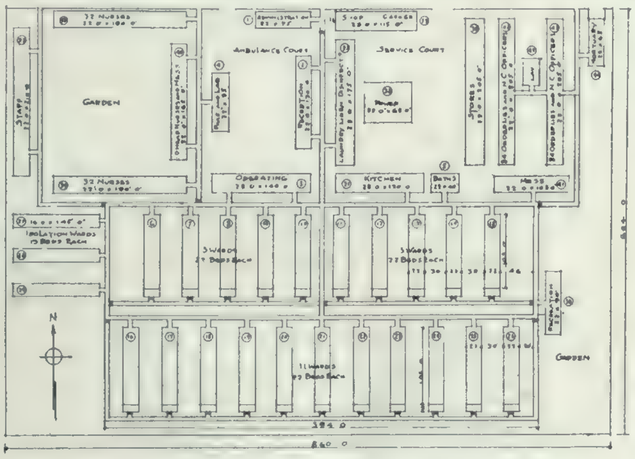
This description might be extended to greater length, but will serve to give a fair idea of the dressing stations and ambulances lying in the advanced zone, the first two or three miles back from the front, where shells may always be expected and danger is at all times present.

The French Medical Corps has devised a most ingenious unit for use in connection with these ambulances—what is known as the Ambulance Chirurgicale Automobile. This consists of a unit construction portable building, comprising a waiting room about ten by sixteen feet, a sterilizing room about the same size, and an operating room about twenty by sixteen feet, all of which can be packed on two motor trucks. Another truck contains a very complete sterilizing outfit, a fourth the X-ray equipment with electric generator, while the fifth serves for general supplies and transport of personnel. These buildings are now being erected with double walls and steam heat, and can be quickly transported to the point on the front where they are most needed.

We now come to the field hospitals lying a little farther back, and in which men can be cared for who need a few days' treatment before being sent on to the rear. They are a cross between the ambulances and the base hospitals, and are either in existing buildings, in tents, or in portable barrack buildings, but more and more in barracks, and with more and more of the conveniences and comforts of the base hospital.

Back of the field hospitals lie the great centres, such as Revigny and Bar le Duc to the rear of Verdun, Belfort in Alsace, Bray and Amiens in the Somme, where the wounded are counted by thousands instead of by hundreds, and where the final sorting out is done.

At Bray, which I visited in October, the group contains three thousand five hundred beds, divided into a hospital of one thousand beds for the seriously wounded who are not transportable, a *depot d'éclopés* of one thousand beds for the slightly wounded and slightly ill, and an evacuation hospital of one thousand five hundred beds for those who are to continue to the rear on hospital trains. The hospital proper is of the unit construction, portable house type, equipped for giving first-class surgical treatment.



General Plan for Base Hospital Adapted to American Conditions
Butler & Rodman, Architects

It was a hospital of this type which I was asked to design to be erected as a model just outside of the gates of Paris.

This plan will serve to show the special requirements of war hospital planning. They are in relative importance as follows:

1. Reduction of road building to minimum.
2. Complete intercommunication between buildings by wheeled cars. Patients, food, linen and supplies of all sorts are carried on wheels, and all buildings must be connected by galleries uninterrupted by steps.
3. Grouping of wards for easy service and with proper north-south orientation, and south end unobstructed.
4. Grouping of administration, technical and general services for easy communication and supervision.
5. Grouping of dwellings for staff, nurses and orderlies for convenience and supervision, and with sufficient separation from patients' quarters.

Although, as a result of certain governmental changes, the plan for the hospital at Vincennes was never executed, it has served as the basis for the plans of many other hospitals to be built all over France, which were submitted for criticism to our committee.

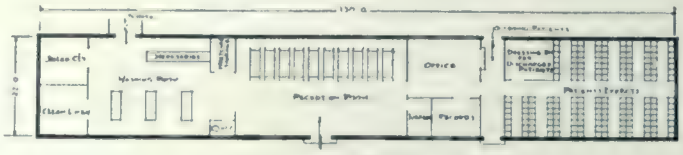
An interesting development of the work of our committee is the plan for the permanent military hospital at Issy les Moulineaux. For this hospital complete plans had been prepared and approved just before war broke out; but as a result of the modifications caused by war experience, we were asked to completely replan the hospital, which in its general scheme of arrangement follows the war hospitals, but is executed in permanent materials.

On my return to the United States last winter I was asked to assist the Committee of Directors of Red Cross Base Hospital Units of New York, and the following plans for typical base hospitals show the result of our work in France as adapted to American requirements.

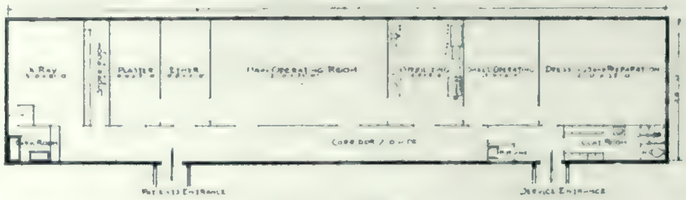
The site selected is assumed to be on the south side of a road, with the ground sloping slightly toward the south. The grouping of administrative and technical services around the ambulance court and the general services around the service court are to be noted, with the orderlies' quarters at the east and the nurses' and doctors' quarters at the west. The only road building required is in the two courts, while the wards lying to the south are connected to the administrative and service buildings and dwellings by covered wooden walks.

The wooden slatted walkway, covered or uncovered, is as much of a necessity in a war hospital as it is in a trench, as mud is the bane of the front, and the slat walk which permits of its elimination, so far as the interior of the hospital is concerned, is invaluable, and as all differences of level are taken up by ramps in place of steps, every part of the group may be reached by food trucks, wheel stretchers, and chairs.

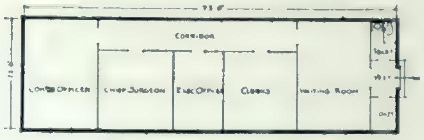
The details of the plans follow in general the ordinary practice, with the necessary modifications to fit military needs. The reception building in its present form is, however, a very definite product of the war. As it must be assumed that every wounded man is filthy, even though not necessarily vermin infested, it is essential that he be thoroughly cleaned before being admitted to the ward. The need of storage rooms for men's uniforms, boots, underwear, etc., and the necessary space for clean linen, surgeons' and clerks' offices, has led to the plan shown. In the center is the receiving room into which the ambulances discharge their loads. In this room the surgeon on duty makes a hasty examination, picking out those most needing prompt transport to the wards. They are then taken in order into the wash room, where their pedigrees are taken, their valuables checked and where after receiving the ward assignments they are cleaned in the table baths, put in clean hospital clothes, and wheeled away to bed, while their soiled clothes go to the disinfecting plant.



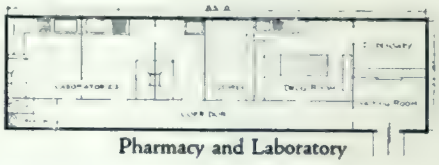
Reception Pavilion



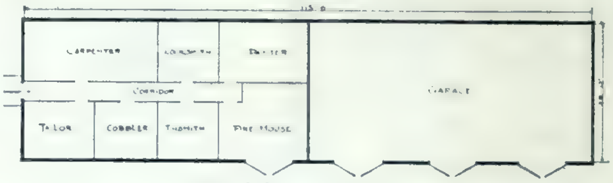
Operating Pavilion



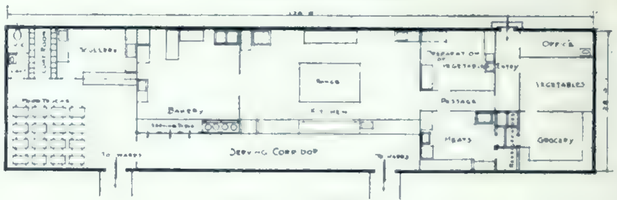
Administration Pavilion



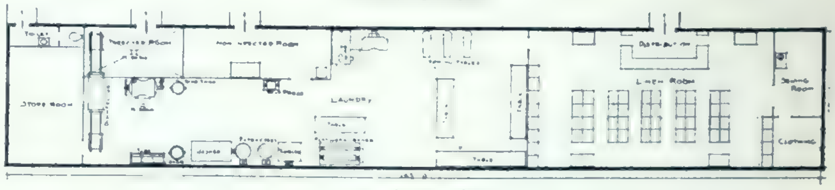
Pharmacy and Laboratory



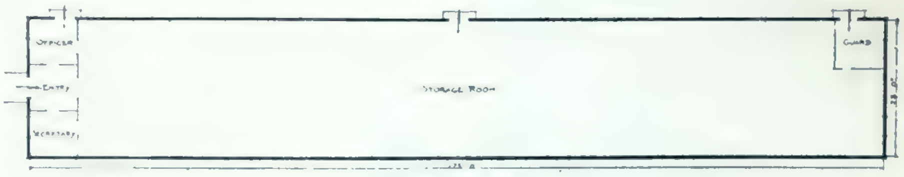
Workshop and Garage



Kitchen Pavilion



Laundry Pavilion



Storage Pavilion

After being washed, disinfected, and repaired, their effects return to the building for storage, where their records and valuables are also kept. When the wounded man is finally convalescent, and ready to be discharged, he comes back to this building, turns in his check, and receives his uniform and personal possessions and, after signing off, is discharged. The advantage of concentrating in one building the receiving and discharging of patients, together with the filing of their records and the storage of their effects, is obvious.

The administration building contains the usual general waiting room and offices, but is considerably less important than the corresponding service in a civil hospital.

The operating pavilion is naturally of especial interest in a war hospital. The plan shows two entrances—one being reserved for patients, while the other permits the orderlies to reach the dressing preparation room and secure their provision of sterilized dressings for the wards, without penetrating into the rest of the building. Other points to be noted are the two operating rooms, the larger planned to accommodate three tables if necessary and the smaller reserved for uninfected cases.

Easy access is afforded to the plaster and X-ray rooms by the corridor seven feet wide. It is to be noted that for the operating pavilion, the twenty or twenty-four foot unit, used for most of the buildings, is insufficient, and the twenty-eight foot unit has therefore been adopted for this building, as well as for kitchen and laundry.

The pharmacy and laboratory building presents no peculiar features.

The plan of the kitchen is of interest, with its space reserved for the food cars adjacent to the scullery, all dishes being kept in the building between meals and the cars being loaded at a counter which extends the full length of the bakery and kitchen proper and serves as a barrier to prevent the orderlies from entering either room. The main entrance for supplies is on the court side of the building, with an office for the receiving clerk and vegetable and grocery storage, refrigerators, meat room, and vegetable preparation room.

In view of the fact that much of the linen and clothing is contaminated, the laundry has two receiving rooms—one for ordinary soiled linen and one for linen, clothing, mattresses, etc., requiring sterilization; these pass either through the sterilizing washer or the steam and formaldehyde sterilizer into the laundry proper, where they join the other linen and are thenceforth treated no differently from the rest.

The storage space for mattresses and pillows and for clothing awaiting condemnation should also be noted, and the size of the repair room and general storage rooms, also the distribution counter in this last room, which prevents orderlies coming with their requisitions for clean linen from entering the storeroom.

The ward buildings, containing each twenty-four beds in the open ward and one in an isolation room, show the consistent development of the war hospital toward the standards of civil practice.

Base hospitals are being planned more and more with sewage disposal systems, and in the case in point complete service is provided with toilets, bed pan and housemaids' sinks, lavatories, kitchen sinks, etc. As relatively few wounded can be bathed in the ordinary tub, there are no bath tubs in the ward buildings, but instead a small central bathhouse is provided, thus materially reducing the expense. An isolation room is provided in each ward unit, also a surgical dressing room, diet kitchen, and nurses' office and linen closet.

Following the custom of civil hospitals the wards are oriented north and south, and the south end is composed entirely of windows so as to permit the greatest possible amount of sunlight to enter. At this south end is placed, on a level with the ward, a terrace, on to which the beds may be wheeled in clear weather, for experience has shown that fresh air and sunlight are as good for wounded as for tubercular patients. The beds must therefore be provided with large rubber tired casters to permit easy rolling.

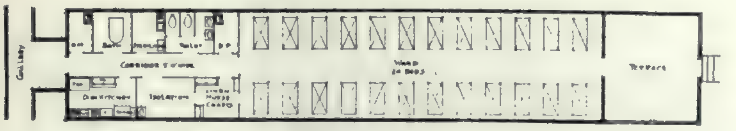
A large recreation building is provided, which may also serve as convalescent mess—it must be borne in mind that in the average war hospital there are many men who except for a local wound are quite well and active, who would be difficult to handle if provision were not made for their distraction in a building specially set apart for this work, usually divided into reading room and room for games.

The French authorities have solved the problem of drinking by providing a canteen, at which each convalescent patient may buy drinks to the extent of one drink per day—a simple method when there is but one source of supply. No treating is allowed.

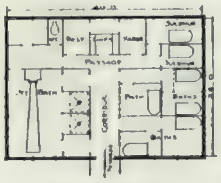
The isolation buildings are designed merely to care for contagious cases which may develop in the hospital, until such time as they may be evacuated to the contagious hospitals.

Individual rooms or cubicles are provided for the medical staff and for the nurses, while the orderlies are grouped in dormitories.

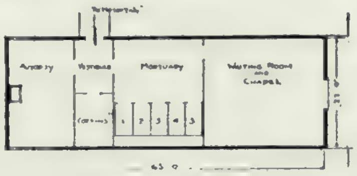
Almost as important



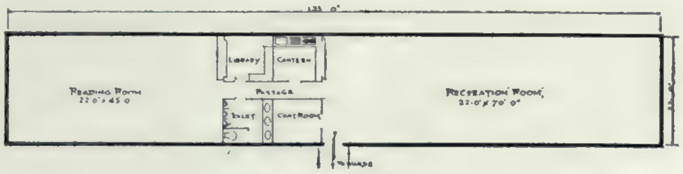
Ward Pavilion



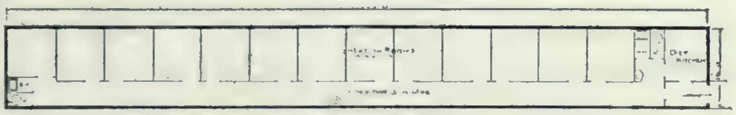
Bath Pavilion



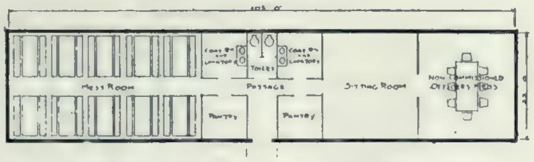
Mortuary Pavilion



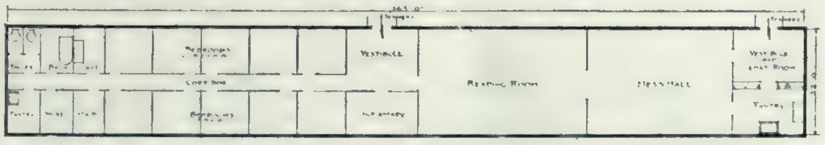
Recreation Pavilion



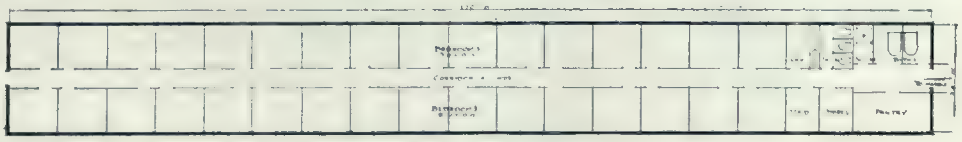
Isolation Pavilion



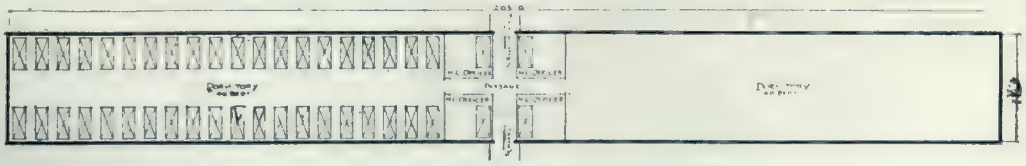
Orderlies' and Non-Commissioned Officers' Mess



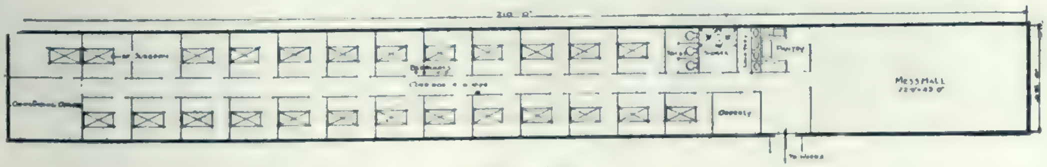
Head Nurses' and Mess Hall Pavilion



Nurses' Dormitory Pavilion



Dormitory for Orderlies and Non-Commissioned Officers



Staff Pavilion

as the planning of a base or field hospital is the choice of materials and type of construction, and here we have much to learn from the experience of our Allies. On the British and French fronts portable house unit type construction is employed almost to the exclusion of other types, the theory being that these buildings will pretty certainly be moved at some stage of their career; there is also the thought that the unit construction building may be of service after the war for temporary use in the regions so completely devastated in France and Belgium. Portable house construction is not used with the idea that hospitals will be taken down and re-erected in three or four hours, as some manufacturers claim for these buildings; but it does seem advisable to use a type of building which may be transported and re-erected if desired.

The English, French, and Belgians have all worked out types of buildings which are far superior in their practical workableness to any of our types; this is natural, in view of the fact that these countries are erecting buildings of this type not by hundreds, but by thousands, but it would be well if we could learn from their experience and avoid their mistakes. A very striking characteristic of the types used abroad is the small size of structural timbers. Europe has never had the immense timber supply which we have been for years wasting, and has always been economical; and the further fact has been realized that it was not necessary to design buildings which should have a life of a generation—on the contrary, all that was needed was a building which could last five or six years; floors are calculated not for stiffness but for strength, and all sections are reduced; one and a half by three inch floor joists, sixteen inches on centers, with span of five feet, are used in one system, and studs are two inches square.

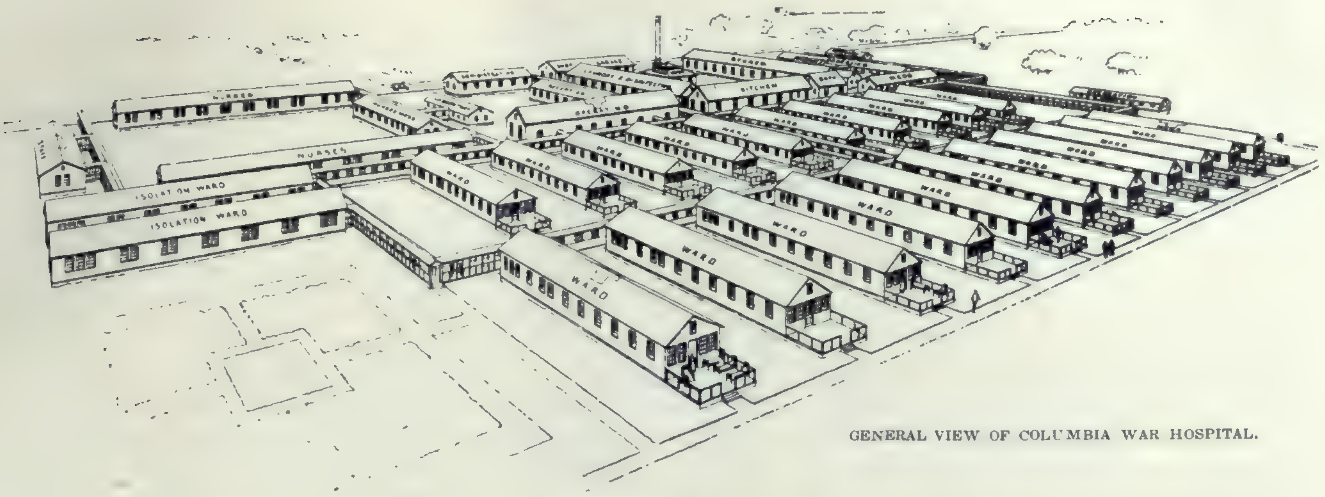
In all of the European systems, after experimenting with single walls, the double wall with an air space has been adopted as being an absolute necessity for hospital wards.

While in general these buildings are heated by stoves, in many steam heat is being installed; some have plumbing, and all electric light. A necessity for wooden buildings is an efficient layout of water supply to hydrants in ample number, for the buildings will burn quickly.

Editor's Note.—Some confusion of terms seems to exist concerning branches of war hospital work, and a brief explanation may be of service. The military units which the Red Cross is authorized by the War Department to create are base hospitals, hospital units, surgical sections, and general hospitals. The work is divided into three zones: the first being the service at the front; the second, the military base to which the wounded are brought and where, in the *base hospital*, the first complete equipment is found; the third, the home country, where military hospitals, called *general hospitals*, are created from existing civil ones. Hospital units are organized groups of physicians, nurses, etc., assigned to military hospitals or hospital trains and ships. Surgical sections are special detachments to reinforce the operating staffs in time of emergency, and consist of four surgeons, seven nurses, two orderlies, and a clerk.

The hospital units, surgical detachments, and base hospitals are movable units, each with individual equipment, and available for service wherever the government may designate.

MICHAELHAM HOME, CAP MARTIN, NEAR MENTONE, FRANCE, FOR CONVALESCENT BRITISH OFFICERS.



GENERAL VIEW OF COLUMBIA WAR HOSPITAL.

Military Hospital at Columbia University

Portable Ward Buildings of Wood With Double Walls—Complete Buildings May Be Erected by Six or Eight Men in Two Days

By Dr. F. C. Wood, Columbia University, New York.

EMERGENCIES incident upon the entry of the United States into the war have, among other things, made very evident the necessity for the design and erection of a large number of hospitals to care for the normal percentage of sick among the enlisted men in camps and also for the wounded who will be returned from France. Two types of construction have been considered: (1) a completely portable form, the so-called standard base hospital type, which can follow the movements of the troops; and (2) a type to be erected in connection with cantonments and other permanent stations, which need not, therefore, be portable. The latter has been the subject of much discussion in army circles, and various plans have been evolved. There is nothing especially novel about these non-portable buildings, however, as they follow the ordinary lines of hospital construction, except that they occasionally employ rather unusual makeshifts which would not be used in more permanent structures, such as the lining of rooms with building paper to insure their being kept at a comfortable temperature even during winter weather.

The Columbia War Hospital, which is the subject of this paper, is of the completely portable or base hospital type and accommodates five hundred patients. The design is a composite one, and is the result of a study of the methods employed on the English and French fronts. It combines the portability of the old tent hospital with many conveniences which the latter can never possess in the way of ventilation, freedom from dampness, and ability to keep the wards at a reasonable temperature even during extreme cold weather.

The first plan, as shown by the architect's sketch, called for buildings to occupy a space considerably over ten acres in extent. In order to adapt the buildings to the slightly irregular piece of land available because owned by Columbia University, some minor changes in the original arrangement were made, though the number of buildings, thirty-eight in all, remained the same.

The situation of the roadway on the south side of the property, for instance, necessitated the removal of the reception and administration buildings to a court to the south. This reversed the position of the wards so that if all the porches on the wards were made to face the south, as is the generally accepted rule in hospital construction, a very long series of corridors for the transport of food from the kitchen would be necessary. One-half the wards were, therefore, turned around so as to make the porches face the north, though they still have a complete east-and-west exposure to sunlight and receive some sun from the south owing to the low roofs of the ward buildings.

The other half of the series of wards has a southern exposure for the porches. By this arrangement the entry of food wagons directly along a single central corridor from the central kitchen to the diet kitchens in the wards was made possible. The operating room was placed on the extreme eastern end of the plot, so that it would have a central position if the hospital is extended to one thousand or one thousand five hundred beds. The garage was placed across the street so that the patients and staff would not be disturbed by the clatter of motors while these were being repaired or tested.

All patients and supplies will be received in a central court, about which are grouped the reception building, where patients are examined before admission, the building containing the offices and record rooms, and the stores and kitchen.

The reception building contains complete equipment for the disinfection of the patient's clothes on admission, facilities for removing vermin, shower baths, etc., and a series of small examining rooms for individual patients.

The general size of the buildings can be approximately estimated from the plan. The dimensions of the ward buildings are twenty-four by ninety-nine feet, with, in addition, an uncovered porch at the end measuring twenty-four by sixteen feet. The isolation wards are slightly longer, eighteen by one hundred and thirty-eight feet. The height of the wards at the eaves is about eight feet; at the peak of the roof, about fifteen feet. Ventilators will be placed in the roofs of the ward buildings if, after trial, it is found to be necessary. So far the wards have proved to be exceedingly comfortable. The operating room measures about twenty-four by one hundred and fifty feet; the kitchen, twenty-eight by one hundred and twenty feet; the laundry, twenty-eight by one hundred and seventy-four feet; the stores, twenty-eight by one hundred and seventy-six feet; and the garage, twenty by one hundred and sixteen feet.

The operating room, kitchen, laundry, and garage are built of thin sheet steel, which comes in sections and is fastened together with a simple arrangement of a yoke and key made so that it can be driven in with a hammer. The steel sheets are thin enough to permit bending by hammering if they have been deformed during transport. Each section is light enough to be handled by two men, the trusses require five or six. The foundations are concrete posts. The steel buildings were supplied by the Trussed Concrete Steel Company.

The remaining buildings are of wood. It was anticipated that the steel buildings would be exceedingly hot, so arrangement was made to have cowls in the roof; these turn with the wind on ball bearings, and as a system of ventilation have proved to be quite satisfactory; even in the hottest weather the buildings are comparatively cool, while before the installation of these ventilators they were often unbearably hot.

The wards and the other buildings are made of a double thickness of wood separated by an air space. The sections are supplied complete with the windows in place. The wooden buildings are set upon short posts, about four feet high, which come as a part of the structure, though, of course, in case of emergency, the buildings can be placed directly upon the ground. On these posts are set the girders. The joists can be seen lying within the rectangular framework. When in place these are held by bolts and nuts, the holes being already bored in the joists when they are received. Over these goes a steel yoke; and the notched floor beams are hung on these yokes. The floor, which also comes in sections, is then laid on and the erection of the walls is begun, the first few pieces being braced by nailing to them a piece of scantling which extends over to a near-by post. As soon as the end of one of the buildings is constructed, the roof girder is put in place and bolted on. This portion of the building will then stand by itself, and the further construction can be rapidly carried out.

Six or eight men can erect one of these buildings in two days, a larger number in correspondingly shorter time.

The protection of the roof is accomplished by laying over the wooden portion a layer of waterproof flexible composition roofing which can be fastened down with nails or can be held down by a board nailed to the roofing at each end.

The general waterproof character of the buildings has been sufficiently tested, as several of them have been erected and have stood through a number of heavy rain and wind storms without any discomfort to the inmates.

Each ward is planned to accommodate twenty-five patients and contains toilets and baths for the patients, a diet kitchen for the serving of meals and preparation of special foods, and a quiet room in which moribund or difficult individuals can be placed.

The drainage, in the case of this particular group of buildings, is accomplished by piping directly connected with the New York City sewers. If the buildings were to be erected at a distance from a city, of course, a special sewage system would have to be constructed. Owing to the availability of electric current, also, the buildings have been wired for electricity; some different scheme would be necessary if current could not be obtained.

The laundry machinery is supplied with direct-drive motors, and the steam used is furnished from a small auxiliary portable boiler. If electricity were not available, a separate power plant would have to be installed to furnish the necessary current. In France and Belgium the base hospitals have usually been placed where current can be obtained.

The method of heating the buildings has not been finally decided upon. The army has been in the habit of using small stoves which can be fed with wood and are very satisfactory. As it is not intended that the plant under consideration shall be moved during the period of the war, it is probable that steam heat will be laid on in the buildings, with the exception of the kitchen and laundry, which are sufficiently heated by the ranges, hot water heaters, and steam pipes.

A portable ice machine which can be towed by a traction engine furnishes sufficient ice for five hundred patients and the necessary personnel, and supplies cooling coils to three portable ice-boxes in the kitchen.

The cost of one of the wooden ward buildings, including the painting, plumbing, electric wiring, and terracing, is approximately $3,300; the cost of the operating room building, which is of steel ceiled with wood, and including the electric light, plumbing, concrete floor, painting, etc., is approximately $8,000, with an additional $400 for metal skylights and ventilators.

The total cost of the plant for five hundred patients, with water, light, and gas connections, painting, fencing, and grading, will not exceed $250,000. The equipment will cost about $20,000 more. A steam heating plant and the necessary plumbing and extras will possibly bring the total to something under $300,000, thus producing a hospital at a cost of about $600 per bed.

The life of the wooden buildings is estimated to be at least five years in good condition. The removal of the buildings to another site has been computed to result in a loss of about three per cent., this loss being chiefly allotted to the waterproof composition roofing and the concrete floors which have been placed in the operating room, the kitchen, laundry, and garage, in compliance with the rules of the fire underwriters controlling structures within the limits of New York City. In the field, wooden floors would be used instead. The steel buildings have, if properly cared for, an indefinite life.

The time required for the erection of the buildings, if sufficient labor is available and all the material can be delivered at once, would probably not be over three weeks, and with a very large force of trained mechanics could be reduced to less.

While the general plan of the buildings has been approved by the War Department for its base hospitals, it is possible that the experience gained in handling and working in these structures will be useful, also, from a civilian point of view as showing what can be accomplished in the way of rapid erection of hospital buildings in case of an extensive epidemic or in connection with the undertaking of large engineering enterprises, such as the building of canals, dams, or similar public works, away from large centers of population.

INSTALLING WARM AIR HEATING

At a special meeting of the National Warm Air Heating and Ventilating Association, held recently, a code was adopted to regulate the installation of warm air furnaces. The various points covered in the code are: meaning of the term warm air heating plant; certified heating contractors; permits; concealing pipes or register boxes; round basement pipes; smoke pipes; stack and registers; cold air ducts; provision for register boxes and stacks; rules for estimating warm air pipe requirements; and furnace casings. The section containing rules for estimating warm air pipe requirement, has the following to say regarding such requirements for seventy deg. F.:

"In no case shall warm-air pipes, extending from furnace be less than eight inches in diameter. To find the area of warm-air pipes leading from furnaces through which heat is to be distributed to building or rooms contained therein, requiring the maintenance of a temperature of seventy deg. F., with the outside temperature at zero, the following rules are to be used:

"To the area of outside doors and windows expressed in square feet, multiply the result thus obtained by seventy-five. To the result thus obtained add an amount equal to the total cubical contents of the building or room as expressed in cubic feet; divide the result thus found by eighty. The result thus obtained will equal the sectional area of the warm-air pipes expressed in square inches."

The following suggestions for improving furnace heating work were made:

1. Set furnaces low and have a good pitch to leaders.
2. Insist upon larger wall stacks to upper rooms.
3. Insist upon fully enclosed metal return ducts, and eliminate the duct formed by rough floor joists and wall studding.
4. Urge an ample fresh air connection to the return system in every furnace job.
5. Insist upon vent ducts through warm walls from bath room and kitchen to attic, with no returns.
6. Develop humidifying furnace attachments.
7. And *most important of all,* each manufacturer should have follow-up system on each furnace sold, so as to learn if it has been installed to the satisfaction of the purchaser. This would eventually run out the sham furnace dealer, who thinks only of his income, and nothing of the reputation of the manufactured product he handles.

◆

A cold storage plant will probably cost twenty-five per cent. more this year than it did last, but it is worth one hundred per cent. more. The goods going into cold storage are higher in cost and are worthy of better protection. In other words, the earning capacity of a cold storage plant is much higher in proportion than the increased cost of the plant itself. With present high prices for food products it is little short of business suicide to try and get along without the best of cold storage facilities where food products of an extremely perishable nature are handled. The actual loss from spoiling will often pay for a cold storage plant in a single season.

Building Costs of Twenty-Two Hospitals

Data Giving Segregated Costs of the Construction of a Group of Hospitals, in an Address by Oliver H. Bartine before the American Hospital Association

It is clearly demonstrated that the degree of efficiency with which the building serves its purpose and is made comfortable and convenient depends most largely upon the character and completeness of its mechanical equipment. Quite as important also is the fact that the heaviest of the operating expenses of the hospital are those connected with the heating and power plant, and the extraordinary repairs and replacements necessary there.

Regardless of the differing views as to the status of artificial ventilation as applied to the hospital, there can be no disputing the fact that the heating plant of the hospital is the most important department. Provision must be made for the heating of the entire building and for a source of steam for laundry, kitchen and sterilizing work. Further, there should be thorough means of ventilating all toilets, kitchens (including diet kitchens), laundry and many other service rooms. It is believed that the consensus of the best opinion also requires that there should be provided exhaust ventilation for all large wards, and in case of hospitals built in congested districts in the cities a supply of fresh air by means of an artificial ventilating system is also desirable.

A great deal is said of the success of natural ventilation, but it may be questioned whether the exponents of such a method of ventilation give proper consideration to the nuisance caused by open windows because of dust and noise, and to the effect of the dry air resulting from natural ventilation, as well as to the difficulty of controlling this method of ventilation.

Serious objections may be offered to any detail of the heating and ventilating equipment which is so arranged as to prevent thorough cleaning of all parts. To this end the hospital type of radiators should be used, these being constructed with an enlarged space between the radiator sections, and the radiators should be suspended from the walls with a space of not less than three inches, and preferably four inches, at the back of the radiators, and not less than five inches between the bottom of the radiators and the floor.

The ventilating grills should be so installed that they may be removed or be readily opened to permit of cleaning of the backs of the grills and the connecting ducts.

The question of the advisability of the installation of an electric power plant depends only upon the size of the hospital. Wherever fire room service for twenty-four hours is necessary and boilers of 100 H.P. capacity or greater are required, there can be little doubt as to the advisability of installing an electric power plant. In practically all hospitals steam at sixty pounds pressure is required for sterilizing purposes and also for laundry purposes. Steam also is required for cooking purposes at forty pounds pressure. The piping system for the sterilizing and laundry work may be combined, but the cooking apparatus should be provided with a separate system of piping, while the heating is connected with still another separate system of piping. Thus the steam must be generated originally at sixty pounds pressure for cooking and to approximately two and a half pounds pressure for heating purposes. It is just as easy and quite as economical to generate steam at eighty to one hundred pounds, or even one hundred and twenty-five pounds pressure, for the operation of engines for driving electric generators.

In the summer, when heat is not required, a considerable proportion of the exhaust steam

TABLE NO. 1a. COST DATA —HOSPITAL BUILDINGS

Building	Cubiture of building	No. of patients.	Cu ft. per patient.	Total cost of building. Total.	Total cost of building. Per cu. ft.	Total cost of building. Per patient.	Cost of heat. & vent. Total.	Cost of heat. & vent. Per cu. ft.	Cost of heat. & vent. Per patient.	Cost of electric system. Total.	Cost of electric system. Per cu. ft.	Cost of electric system. Per patient.	Cost of electric system. Per outlet.	Cost of electric fixtures. Total.	Cost of electric fixtures. Per cu. ft.	Cost of electric fixtures. Per patient.	Cost of electric fixtures. Per fixture.	Cost of plumbing system. Total.	Cost of plumbing system. Per cu. ft.	Cost of plumbing system. Per patient.	Cost of plumbing system. Per fixture.	Cost of refrig. plant incl. boxes. Total.	Cost of refrig. plant incl. boxes. Per cu. ft.	Cost of refrig. plant incl. boxes. Per patient.
1...	2,096,000	225	9,320	$897,166	$0 428	$3,987.00	$86,461	$0 04	$384 00	$26,399	$0.012	$111.00	$16.50	$7,971	$0.003	$35.40	$7.00	$61,789	$0.029	$274.00	$226.40	$17,308	$0.008	$77.00
2....	1,919,287	181	10,603	610,000	0 317	3,370 70	55,500	0 029	306 70	15,920	0 008	88.00	....	3,250	0.002	18.00	...	45,800	0.023	253.04	....	16,900	0.008	93.92
3....	1,687,000	152	11,098	525,000	0.311	3,453 94	41,660	0 025	272.00	12,962	0.007	85.00	7.35	5,000	0.003	32.89	6.39	37,500	0.022	246.05	143.70	13,700	0.008	90.13
4....	3,338,000	500	6,676	851,000	0.255	1,702 00	104,705	0 031	209.40	31,729	0 009	63.46	....	9,772	0.003	19.54	...	55,332	0.013	110 60	....	25,947	0.008	51.88
5. ..	4,230,103	450	9,40[illegible]	1,736,739	0 41	3,815 00	141,137	0.033	313 60	27,632	0.006	61.40	8 00	10,000	0 002	22 22	5.80	109,664	0 026	243 70	165 65	37,722	0.009	83.82
6....	1,343,815	150	8,958	516,733	0 384	3,445 00	48,595	0 036	324.00	....	....	....	....	3,575	0 002	24.83	...	32,600	0.024	217 33	150 00	.....	....	....
7....	756,355	150	5,042	251,081	0 332	1,606 00	26,452	0.035	175 00	9,594	0 013	63.90	10.90	2,180	0.003	14.10	6.00	23,000	0.03	153 00	[illegible]	5,300	0 007	35.50
8.. .	1,406,400	232	6,062	531,954	0.40	2,720.00	....	....	....	3,000	0.002	14 90	....	....	....	....	...	....	....	....	....	.....	....	....
9....	508,375	70	7,262	214,164	0 44	3,061.00	10,855	0 018	155 20	....	....	....	....	....	....	....	...	....	....	....	....	3,368	0.007	48.10
10....	1,327,413	179	7,416	679,182	0 51	3,800 00	82,887	0 06	460.00	26,886	0 02	149 00	13 00	6,561	0 005	36 09	6 32	65,265	0 05	362 50	253 00	21,211	0.01	118.00
11....	905,800	250	3.623	599,220	0.44	1,600 00	46,000	0.05	184 00	7,600	0.008	34 00	...	....	....	....	...	17,000	0 019	68 00	....	.....	....	....
12. ..	249,700	85	2,937	87,367	0 35	1,027.85	5,688	0 022	67.00	1,700	0 007	20.00	....	....	....	....	...	6,200	0 025	73.00	....	443	0.002	. 5.21
13	210,300	—	—	74,945	0 35	—	4,600	0 022	—	2,500	0.011	—	....	....	....	—	...	2,525	0 012	—	....	.....	....	—
14 ..	1,718,010	410	4,190	686,754	0 40	1,675 00	70,000	0 04	170 30	8,700	0 005	'21.22	....	3,640	0 002	9 00	...	51,439	0 03	125.45	....	.....	....	....
15. ..	1,877,931	350	5,337	789,795	0.42	2,256.60	52,180	0.028	150 00	49,501	0 024	141.50	....	9,750	0.005	28.00	...	72,840	0 04	208 11	....	40,000	0 021	114.30
16. ..	927,415	—	—	500,876	0 51	—	57,500	0 06	—	6 800	0 007	—	....	1,744	0.002	—	...	85,000	0 09	—	....	62,000	0 066	—
17. ..	534,150	—	—	394,000	0.73	—	*....	....	—	1,100	0.002	—	....	....	....	....	...	10,000	0 018	—	....	.....	....	....
18	1 967 762	407	4,834	758,404	0.39	1,863 40	63,125	0 039	155 08	14,366	0 007	35 30	....	4 000	0 002	9 82	...	62,650	0 032	154 00	....	6,882	0.003	17.01
19....	3,768,282	303	12,440	1,366,780	0 36	4,510 80	137,000	0 037	452 14	20,875	0.006	68 72	....	6,823	0 002	22 51	...	111,200	0 03	363 70	....	58,250	0.017	192 24
20....	777,308	150	5,182	257,761	0 33	1,718 40	20 611	0 026	137 40	9,000	0 011	60 00	....	....	....	....	...	20,900	0 02	179.33	....	3,500	0.004	23.33
21....	367,200	110	3,340	146,521	0 40	1,332 00	3,000	0 008	27 27	3,200	0 009	29 09	....	2,540	0 007	23.09	...	12,197	0 038	110 90	....	.....	....	....
22 ...	3,704,287	220	16,837	1,134,974	0 30	5,159 00	115,989	0 031	527 22	19,984	0 006	90 83	....	5,938	0 002	27 00	...	102,614	0 019	467.00	....	7,433.	0.002	33.80
Avrge cost p'r cu ft . .		...	....	....	0 382	....	. .	0 033	....	.	0 009	....	....	....	0 003	....	...	....	0.029	....	....	.....	0.012	....

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*In power plant

may be utilized for heating water for laundry purposes, for heating driers and for other purposes.

In many such plants the electric current is being made at a cost of one cent per K.W.H., and one of our largest New York hospitals made their electric current for ⅝c. per K.W.H. In another of our New York hospitals an installation costing $17,000, and including electric power plant and refrigerating plant, resulted in a saving of $7,100 annually

A great deal has been written concerning the cost of hospital buildings. Any statement of cost based upon the cost per bed may be misleading to the trustees, superintendent and others. For instance, a hospital caring for a special class of patients requiring extra rooms and special equipment cost $4,000 per bed. If the same building had been planned as a general hospital beds could have been placed in the special extra rooms mentioned, thus increasing the bed capacity of the building to such an extent that the cost of the building would not have exceeded $3,000 per bed. This hospital has special employees for special purposes and rooms, but perhaps not as many as would be required to care for the extra number of patients which might have been accommodated in the special rooms, but even after making liberal allowances for these conditions it is found that this hospital would not have cost over $3,300 per bed if used as a general hospital instead of $4,000 per bed, as it actually cost, based upon the number of patients accommodated.

After making a careful study of this matter of costs the author has come to the conclusion that a better basis of determining the cost of the hospital building is the cost per cubic foot. In determining the number of cubic feet of the hospital, measurements should be taken from the basement or sub-basement (lowest floor level to the mean of the outside of the roof, and from outside to outside of walls. In other words, the cubic feet of air displaced by the exterior dimensions of the building should be considered, eliminating approaches, balustrades and all other projections not enclosing space.

It is true that it is quite possible to be wasteful in space, so that the cubic feet of space per patient may also well be given consideration.

In table No. 1 are presented segregated costs of the construction of twenty-two hospitals and hospital buildings. In the case of hospital No. 22 the cost per patient is shown to be $5,159, which is very high, while the cost per cubic foot is shown to be 30 cents, and this is very low.

It has been stated that no hospital building should cost in excess of 30 cents per cubic foot, but it will be observed by reference to this table that rarely is a general hospital built at such a low cost. The fact of the matter is that local conditions, the character of the hospital and its work, and the elaborateness of the structure must all be carefully considered in determining the price per cubic foot. Eliminating No. 17 (which is a boiler house), the cost per cubic foot of all of the hospitals listed averages .382 cent. The cost of the heating and ventilating equipment per cubic foot averages .033 cent (after eliminating No. 9, which included no boiler plant).

The cost of the electric system averages 1 cent per cubic foot; electric fixtures average .003 cent per cubic foot; plumbing averages .029 cent per cubic foot (omitting No. 16, which is a laundry building); refrigerating plants average .012 cent per cubic foot; vacuum cleaner systems .002 cent per cubic foot; elevators .007 cent per cubic foot; laundry equipment (excluding Nos. 13 and 16, which are purely laundry buildings) .004 cent per cubic foot; kitchen equipment .004 cent per cubic foot; power plants average .005 cent per cubic foot. Thus the construction of the building (exclusive of its fixed equipment) averages .273 cent per cubic foot, as shown by this list.

Table No. 2 gives a segregated statement of the cost of hospital buildings exclusive of equipment, in the case of thirteen hospitals.

In the case of certain items, as masonry, the cost per cubic foot corresponds very closely in the case of practically all of the hospitals listed.

TABLE 1b. COST DATA—HOSPITAL BUILDINGS

	Cost of vac. cl. syst.			Cost of elevators.			Cost of laundry equipt.			Cost of kitchen equipt.			Cost of power plant				Percentage contracts bear to total cost of building.										
Building.	Total.	Per cu. ft.	Per patient.	Total.	Per cu. ft.	Per patient.	Total.	Per cu. ft.	Per patient.	Total.	Per cu. ft.	Per patient.	Total.	Per cu. ft.	Per patient.	Per K.W.	Building.	Heat. & vent.	Electric.	E. fixtures.	Pl'bing.	Refrig.	Vac. cl'n.	Elevators.	Laundry.	Kitc'n.	Power plant.
1....	—	—	—	$22,225	$0.016	$99.00	$9,729	$0.004	$43.20	$3,239	$0.001	$14.30	$15,000	$0.007	$66.66	$75.00	72.2	6.9	2.9	0.9	6.9	1.9	—	2.5	1.1	0.4	1.6
2....	$1,900	$0.001	$10.49	11,200	0.006	61.80	6,320	0.003	34.90	6,475	0.003	36.00	7,400	0.004	40.90	30.00[2]	73.4	8.1	2.6	0.5	7.5	2.8	0.3	1.8	1.0	1.0	1.0
3....	—	—	—	3,360	0.002	22.10	5,956	0.004	39.11	4,000	0.003	26.32	7,078	0.004	46.50	70.78	75.2	7.9	2.5	0.9	7.1	2.6	—	0.64	1.1	0.76	1.3
4....	—	—	—	22,475	0.007	44.95	11,707	0.003	23.41	—	—	—	15,440	0.005	30.88	44.11[3]	67.1	12.3	3.7	1.1	6.5	3.5	—	2.6	1.4	—[3]	1.8
5....	2,603	0.006	5.70	32,280	0.008	71.73	20,713	0.005	46.00	13,802	0.003	30.70	21,570	0.005	47.90	95.86	74.26	8.1	1.8	0.6	6.4	2.1*	0.15	2.6	1.4	0.79	1.8
6....	....	....	....	16,515	0.012	110.00	5,298	0.004	35.32	4,118	0.003	27.45	.....	....	....	....	...	9.4	0.6	..	6.3	..	..	3.2	1.2	0.8	..
7....	....	....	....	2,450	0.003	16.30	3,575	0.005	24.00	....	....	....	4,530	0.006	30.00	75.00	...	10.2	4.6	0.8	9.2	2.1	..	1.0	1.4	..	2.0
8....	....	....	....	.....	....	....	4,954	0.004	21.40	9,000	0.006	39.00	—	—	—	—	...	..	0.6	..	..	..	..	..	0.9	1.6	—
9....	—	—	—	.....	....	....	—	—	—	....	....	....	14,176	0.028	202.50	141.00[1]	...	5.0	...	..	.	1.5	—	..	—	..	6.6[1]
10....	—	—	—	16,100	0.013	90.00	—	—	—	6,900	0.005	38.33	.....	....	....	....	...	12.0	4.0	1.0	9.6	3.1	—	2.4	—	1.1	..
11....	....	....	....	8,000	0.009	32.00	....	....	....	....	....	....	.....	....	....	....	...	11.8	2.0	..	4.6	.	..	2.0	..	..	..
12....	....	....	....	1,115	0.005	13.00	....	..	....	....	....	....	.....	....	....	....	...	6.9	2.0	..	7.0	0.5	..	1.3	..	..	..
13....	—	—	—	.....	....	—	16,000	0.08	—	—	—	—	—	—	—	—	...	6.1	3.3	.	3.4	—	—	—	21.3	—	—
14....	5,575	0.003	13.60	6,200	0.005	15.12	...	....	....	....	....	....	.....	....	....	....	...	10.2	1.3	0.6	.75	..	0.8	0.9	..	..	..
15....	5,985	0.003	17.10	19,000	0.01	54.28	....	....	....	....	....	....	†.....	....	....	....	...	6.6	6.02	1.3	9.3	5.8	0.8	2.5	..	..	..
16....	2,400	0.002	—	8,000	0.009	—	53,382	0.059	—	—	—	—	—	—	—	—	...	11.5	1.3	0.3	16.0	12.3	0.4	1.6	10.6	..	..
17....	—	—	—	1,500	0.003	—	—	—	—	—	—	—	161,500	0.302	—	....	...	..	0.3	..	3.0	..	..	0.5	..	..	41.0
18....	3,625	0.002	9.00	7,625	0.004	18.73	....	....	....	....	....	....	.....	....	....	....	...	8.4	1.9	0.5	8.3	0.9	0.5	1.0	..	..	..
19....	....	....	....	16,500	0.005	54.45	....	.	....	....	....	....	.....	....	....	....	...	10.0	1.6	0.5	8.9	4.3	..	1.2	..	..	..
20....	4,500	0.005	30.00	9,000	0.01	60.00	....	....	....	....	....	....	.....	....	....	....	...	8.0	3.5	..	8.0	1.3	1.7	3.5	..	..	..
21....	....	....	....	2,700	0.008	24.54	.	.	. .	2,500	0.007	22.72	.....	....	....	....	...	2.0	2.0	1.9	8.0	..	..	2.0	..	2.0	..
22....	....	....	....	5,855	0.0016	26.61	15,601	0.005	709.13	8,000	0.002	36.66	66,000	0.018	300.00	....	...	10.2	1.7	0.4	9.0	0.6	..	0.5	1.4	0.7	6.0
Avrge. cost p'r cu. ft..	....	0.0023	....	.....	0.007	....	....	0.017	....	....	0.0037	....	.....	0.047	....	....	72.44	7.2	2.4	8.0	7.6	2.9	0.80	1.76	3.9	1.01	7.0

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[1] Provides capacity for several other buildings. [2] No piping included [3] Large amount of piping involved. †In electric system.

CEMENT PAINT PROTECTS STEEL

It is generally conceded that steel embedded in concrete will not rust so long as the concrete is free from voids. In the trials that were carried out a number of steel rods were painted, some with red lead, others with boiled linseed oil, some with neat Portland cement, and a few were not treated in any way. The painted rods were allowed to dry in the shade for one week, and then all were embedded five inches deep in concrete. After a time the specimens were tested in an Olsen machine by pulling the steel rods out of the concrete, and, although the adhesion of the uncoated rods was perfectly satisfactory, it was found to be still better in the case of the rods painted with cement. During the experiments the best results were obtained when the cement setting was maintained repeatedly for several days, either by rain, dew, or by an artificial spray of water. In the first two or three days the coating can be rubbed off easily, but after that it adheres firmly to the steel. The adhesion is increased about thirty-five per cent. by a coating of neat cement. To determine the cost of applying a coating of cement to structural steel, one pound of Portland cement was mixed with two-thirds pound of water. This quantity was found sufficient to cover seventy square feet one coat, and, consequently, the expense, other than labour, was very trifling.

COST DATA OF HOSPITAL BUILDINGS

BUILDING		1	2	3	4	5	6	7	8	9	10	11	12	13		AVERAGE COST PER CU. FT.
CUBITURE OF B'LD'G		905,800	249,700	210,800	1,327,413	1,718,010	1,877,931	927,415	534,150	1,967,762	3,768,282	777,508	367,200	2,096,000		
COST OF CONSTRUCT'N		320,620	72,221	49,320	441,682	541,214	540,539	224,050	219,900	594,131	1,016,132	190,250	120,384	647,045		
COST OF MECH. EQUIP'M'T		78,600	15,146	25,625	237,500	145,540	249,256	276,826	174,100	164,273	350,648	67,511	26,137	250,121		
TOTAL COST OF B'LD'G		399,220	87,367	74,945	679,182	686,754	789,795	500,876	394,000	758,404	1,366,780	257,761	146,521	897,166		
EXCAVATION	TOTAL	22,220	1,110	2,500	28,541	33,000	40,000	40,000	33,600	79,750	138,000	5,000	4,917	50,895		
	PER CU. FT.	.024	.004	.011	.025	.019	.021	.043	.063	.041	.036	.007	.013	.025		.026
MASONRY	TOTAL	111,700	25,216	23,420	175,303	260,950	196,760	91,050	105,900	249,147	417,093	71,650	53,654	222,870		
	PER CU. FT.	.12	.10	.11	.132	.152	.105	.098	.198	.127	.111	.092	.146	.12		.124
STRUCTUR'L STEEL & IRON	TOTAL	55,450	11,500	9,500	59,958	66,000	90,414	35,000	37,500	71,738	115,750	33,100	17,000	80,648		
	PER CU. FT.	.06	.05	.04	.045	.038	.048	.038	.070	.036	.031	.043	.046	.04		045
CARPENTRY	TOTAL	20,400	7,400	6,500	46,348.	55,500	60,000	22,000	5,800	65,395	61,000	19,025	12,000	71,226		
	PER CU. FT.	.022	.03	.03	.035	.032	.032	.024	.018	.033	.016	.024	.033	.035		.028
ROOFING	TOTAL	18,000	5,800	3,000	9,700	9,319	48,365	8,100	9,500	13,523	41,687	In Steel & Iron	8,367	23,080		
	PER CU. FT.	.02	.02	.014	.007	.005	.026	.009	.018	.007	011	—	.024	.011		.010
GLASS & GLAZING	TOTAL	In Carpentry			In Carpentry	In Carpentry	In Carpentry		In Carpentry		36,000	1,000	400	6,202		
	PER CU. FT.	—			—	—	—		—		.0095	.001	.001	.003		.0036
SKYLIGHTS & SHEET METAL	TOTAL	In Roofing			In Roofing	In Roofing	In Roofing		In Roofing	In Roofing	In Roofing	8,525	In Roofing	In Roofing.		
	PER CU. FT.	—			—	—	—		—	—	—	.011	—	—		.011
PAINTING	TOTAL	5,000	1,095	950	In Carpentry	4,250	In Carpentry		In Carpentry	3,564	In Carpentry	In Carpentry	5,000	26,478		
	PER CU. FT.	.005	.005	.004	—	.002	—		—	.002	—	—	.014	.013		.006
LATHING & PLASTERING	TOTAL	10,000	2,660	1,750	16,500	22,800	20,000	6,000	400	20,225	37,500	15,000	10,060	41,237		
	PER CU. FT.	.01	.017	.008	.012	.013	.011	.007	.0008	.01	.01	.009	.027	.026		.0125
COMPOSITION FLOORING	TOTAL				13,103	20,000	14,000		5,000		29,000	3,750	In Masonry	8,106		
	PER CU. FT.				.01	.015	.008		.009		.008	.002	—	.004		.008
TILES. MOSAICS & MARBLE	TOTAL	46,000	17,000	1,200		18,200	31,000	1,500	800	41,260	65,600	11,000	2,886	65,029		
	PER CU. FT.	.05	.07	.006		.016	.017	.0016	.0015	.021	.0174	.014	.008	.031		.0211
HARDWARE	TOTAL	4,850	440	In Carpentry	In Carpentry	4,100	5,000	400	400	5,125	9,500	2,200	In Roofing	9,080		
	PER CU. FT.	.005	.002	—	—	.002	.003	.0004	.0008	.0026	.025	.0028	—	.004		.005
CAST IRON	TOTAL	27,000	In Steel & Iron	In Steel & Iron	30,000	49,095	35,000	20,000	21,500	44,210	35,000	19,000	5,500	44,189		
	PER CU. FT.	.03	—	—	.023	.023	.019	.022	.04	.022	.009	.024	.015	.022		.022
BRONZE & BRASS WORK	TOTAL															
	PER CU. FT.															
TOTAL COST PER CU. FT.		.44	.35	.35	.51	.40	.42	.51	.73	.39	.36	.33	.40	.428		.432

Canada's Selling Problem After The War

A New Viewpoint of Salesmanship Presented in a Thoughtful Address Delivered by Mr. George A. Simpson, Sales Manager of the Steel Company of Canada, at a Recent Convention of the Sales Staff of that Large Organization

WE have been and are passing through a period, the like of which does not appear in history, and through this abnormal condition, a prosperity that is, in my judgment, spotted, has sprung up all over the North American continent, and it will come to a temporary end directly the war terminates; in fact, I anticipate a decided change the moment there is any definite indication of peace.

GEORGE A. SIMPSON.

Before becoming Sales Manager of the Steel Company of Canada, Mr. Simpson had an extended experience in the steel industry, learning the trade in England and moving to Pittsburgh in 1886. His most recent United States connection was as special representative of the Berger Company, Canton, Ohio.

The abnormal conditions produced by the war have also created abnormal conditions in every line of industry, and, in consequence, the producers of all kinds of material, especially iron and steel products, have increased their output to an enormous and alarming extent. This applies, not only to Canada, but also to the United States. Practically every blast furnace on the continent today is in operation, and to take care of the increased tonnage of finished product that this abnormal condition demands, our producing capacity has been largely increased, consequently when conditions again assume their proper shape we will be confronted with a competitive condition such as the world has never seen before, and this condition will, in a sense, bring into effect the law of the survival of the fittest. Competition, in my judgment, will be fierce, and, in consequence, the burden will fall on the shoulders of the salesmen.

After the war the business that expects to succeed will have to be safeguarded by active, alert, attentive, vigilant men—men of big vision, men who realize that while there can be only one captain of the ship, there is captain-material in the crew, and as such they must be recognized. The order of the day will be: systematic organization, so adjusted as to permit of aggressive, intensified action, all moving in harmony with a determined purpose toward a definite end. The day of the "One Man Business" is gone; just as sure as the day of intoxicated salesmen has passed into the discard. Business to-day is too big for any one man to personally direct, and where any man aspires to be "IT" in an organization, that business will only expand or succeed to the extent of his vision, and, in consequence, if he persists the progress will be arrested in proportion to his ability to direct. The expansion and growth of the business will be retarded. Therefore, the burden of successful business must fall on many shoulders, and the salesman worthy of the name will be recognized and in great demand.

PRODUCTION FACILITIES GREATLY INCREASED.

It will not be a question of production, as it has been during the past two years; it will be a question of selling the production we are able to produce, and this, in my judgment, is going to be a very serious problem. Every producer of iron and steel products all over this continent has increased his output to such an extent that the market will be flooded with material. To make this argument more specific, we need only refer to our own facilities, which, at the outbreak of the war, were such that we had a certain melting capacity of open hearth steel. This we have increased, until to-day we have facilities to produce more than double the amount, and so all along the line, as a result of the terrific demand on our manufacturing facilities, our output has been speeded up to a greatly increased extent, in consequence of which we will have a very large volume of iron and steel products to sell.

With this condition confronting us, the thought uppermost in my mind is, how we shall best prepare ourselves to successfully cope with it, and I have concluded that considerable work and preparation is necessary for each and every one of us. In past years we have heard a great deal about "getting the name on the dotted line," which, of course, as you all know, means the closing of a Contract of Sale. While this expression has been made in the spirit of enthusiasm—all of which I recognize is a determining factor in salesmanship, as there has been nothing of any consequence accomplished without enthusiasm—yet, nevertheless, the advice to get the name on the dotted line is merely an expression and an empty phrasing of words, unless it is accompanied with some commonsense suggestion as to how to prepare ourselves to bring about this much-desired objective. "Getting the name on the dotted line" is usually the final operation. In other words, it is merely the approval with our signature of the transaction which has been concluded, and, in consequence, the importance does not lie in getting the name on the dotted line as much as it does in the manner in which we conduct the transaction, as you will readily see from this argument, that the name would never be put on the dotted line unless the transaction had been conducted in a thorough manner and to a successful end. In other words, it should not be necessary for a salesman to urge or use any mysterious tactics, or enthusiastic efforts to get the buyer's name on the dotted line; but, to the contrary, he should so present his argument and create in the mind of the buyer such an intent desire to purchase that which the salesman has to sell that the buyer would really be more anxious to get his name on the dotted line than the salesman would be to have him put it there.

CREATING DESIRE FOR PRODUCTS.

It seems to me that salesmen should fully appreciate the fact that it takes two to make a transaction, and that it is just as necessary for the buyer to purchase the material the salesman has to sell as it is for the salesman to sell it; in fact, he could not run his business without the material, consequently, isn't it reasonable to suppose that if you represent a high class organization who manufacture their products with the thought of quality uppermost in their mind, and whose very foundations are built on quality and service, fully understanding and appreciating the definitions of these two words, a purchasing agent, representing a company who desires the best products than can be purchased, will want to have his name on the dotted line of that company's contract? It seems to me that it is the salesman's mission to so represent the company he works for, and so place before the buyer the articles he has to sell, as to create a desire on the part of the purchaser to want to do business with the company the salesman represents.

There are a number of manufacturing concerns in different parts of the world who have brought their business up to this very desirable condition, and it is considered a badge of honor or compliment to the good standing of a company when they can state they buy from such a concern. The salesmen who represent such concerns are imbued with the spirit of the organization of which they are a part, and, in consequence, they convey and impart that feeling to the man they are trying to interest. And in proportion to their sincerity of purpose and their belief in the statements they make do they impress and convince and create in the mind of the buyer a desire to do business with them.

COMMERCE IS HUMAN SERVICE.

Commerce is no longer exploitation—it is human service; and no business concern or body of men can succeed or exist permanently whose efforts do not meet a human need and add to human happiness, as we succeed only through the good-will and good wish of the people we serve. "Quality" and "Service" to-day correspond with the word "Sterling" on silver, and happiness is the true end and aim of life, the result of all that is truly right and sane. Therefore, it is not to urge your getting the name on the dotted line that I propose to touch on, but to try and put forward what, in my judgment, is necessary for a salesman to understand in order to carry the transaction to a successful issue.

The subject of "salesmanship" is one that has been discussed from all angles. We have heard a hundred different views from a hundred different people on the one subject, and I am free to admit that but very few of them analyze the subject to the point of rendering a service to the salesman who hears the discourse. In other words, they deal with the subject in the abstract rather than in the concrete. In my judgment, what a salesman ought to know and understand should relate to the underlying principles pertaining to salesmanship; that is, he should be familiar with the principles which would enable him to take care of all the preliminaries necessary to bringing the transaction up to the point of getting the name on the dotted line. The question of selling is one that requires a great deal of thought, and for any man to become proficient in this science it is as necessary for him to study all the elements that enter into his success as it is for a surgeon, doctor or lawyer, or any other professional man, to make a study of his profession before he becomes recognized. I know of no calling in which it seems to be understood that anyone without training may enter, other than the field of sales. It seems to be accepted in a general way that the constituent parts of a salesman are: ability to talk—irrespective of whether he says anything—to dress well, carry a good-looking grip, and last, but not least, he is always expected to be loaded up and able to tell the latest joke and relate a funny story. This, of course, is looking at salesmanship from a ridiculous standpoint, but it is really the viewpoint from which it is seen by a great number of people.

BORN INTO THE PROFESSION?

We have also heard that salesmen are born; and "a born salesman" is a common expression. I am free to admit there are a number of salesmen who were born with certain faculties essential to successful salesmanship, a little more pronounced than in others, in whom some other faculty is more pronounced, but that a man cannot be trained to become a good salesman—if he will give the right amount of study and desires to be successful in that line—is sheer nonsense. We may just as well say that all men who follow certain professions are born into those professions, or born with certain faculties especially fitted for those professions. In my judgment this is wrong, and I maintain that any young man, endowed with commonsense, fair personality, good health and the love of work fairly pronounced, can, with the right amount of study, become a successful salesman. The truth, as always, lies between the two extremes. There is no salesman so born to his duties that he can dispense with a knowledge of the goods he sells, or so independent of experience that practice teaches him nothing he did not know. You should know what you want to do, then hold the thought firmly, and do every day what should be done, and every sunset will see you that much nearer to the goal. Now the question is: "What should he study, and how can he prepare himself?"

Last year I embodied in my discourse the science of thought and the law of attraction, both of which I know are essential factors in the success of a salesman. I will now touch on another vital element, which we will call Personality. There is something about one's personality that cannot be explained; it cannot be photographed; neither can the painter or sculptor reproduce it; yet it is one of the most important factors in our success or failure in life. It is this indescribable quality, which some persons have in remarkable degree, that holds an audience spellbound, and makes people applaud beyond the bounds of enthusiasm. Charm of personality is a divine gift that will sway the strongest characters. We are unconsciously influenced by people who possess this magnetic power. Of course, that rare charm of manner which captivates all who come within the sphere of its influence, and that strong personality which inclines all hearts toward its fortunate possessor, are largely natural gifts. But we find that the man who practices unselfishness, who is generously interested in the welfare of others, who feels it a privilege to do a fellow-creature a kindness—even though polished manners and a gracious presence may be conspicuous by their absence—will be an elevating influence wherever he goes. He will bring encouragement to and uplift every life that touches his. He will be trusted by all who come in contact with him. This type of personality we may all cultivate if we will.

PERSONALITY IN BUSINESS.

Personality is intangible; this mysterious something which we sometimes call "individuality," is often more powerful than ability that can be measured, or qualities that can be rated. And while it is, like poetry, music or art, a gift of Nature, it can be acquired and cultivated to a very great extent. And in this connection it is well to cultivate a mild, gentle and sympathetic voice, and a sure way to cultivate it is to be mild, gentle and sympathetic yourself. The voice is the sounding board, the index of the soul. It is through the voice we give expression to our thought; therefore, fix your mind on the thought and the voice will follow; and if it is filled with truth, it will vibrate with sincerity, echo with sympathy, and so convince your hearers that thoughts in their mind contrary to your own are impossible. It is the man who acts his thought and thinks little of the act who succeeds. Because success is the most natural thing in the world there is no secret to it. The man who does not succeed fails because he has placed himself in opposition to the laws of the universe, which is progress. The pathway to success is in serving humanity. By no other means is it possible. Just live your life—work hard—and don't explain. Mind your own business and give others a chance to mind their's, and you can depend upon it great men will appreciate you for this very thing; and while I am not sure that absolute, perfect justice comes to everybody in this world, I do know that a very good way to get a fair slice of justice is not to think of it, or be too anxious about getting it. The great rewards gravitate to the man who fits himself to receive them. The man who does his work so well that he needs no supervision has already succeeded, and the acknowledgment of his success is sure to follow. The work of the world must be done, and civilization is simply a search for men who can do it.

THE FACULTY OF OBSERVATION.

Tact is also a very important factor; next to a fine manner, perhaps the most important. One should know what to do and be able to do the right thing at the proper time. Observation, good judgment and commonsense are indispensable to those trying to acquire the power of personality. Referring to observation, Herbert Spencer says: "An exhaustive observation is an element of all great success." Therefore, there is no position in life where a trained eye and the faculty of observation cannot be made a great success asset. The efficient salesman is always growing; he is always accumulating knowledge of every kind. He does not merely look with his eyes—he *sees* with them; and he not only uses the optic nerve, but he uses his *mind.* He keeps his mind open to all that is new and helpful. Careless, indifferent observation does not go back of the eye. If the mind is not focussed, that which we see is not clear cut; we do not carry it with force and distinctness to the brain, and, therefore, we are not able to draw accurate conclusions. The faculty of observation is particularly susceptible of cultivation, and is capable of becoming a mighty power and a big asset in the success of a salesman. No matter where you go, study the situation thoroughly; observe and store your observation away in your mind—some day it will serve you well. Good taste is also one of the elements of personal charm, as you cannot offend the tastes of others without hurting their sensibilities. The power to please is a tremendous asset. What can be more valuable than a personality which always attracts. It is not only valuable to a salesman, but to everyone in every field of life.

The ability to bring the best that is in you to the man you are trying to reach, to make a good impression at the first meeting, to approach a prospective customer as though you had known him for years—without offending his taste, without raising the least prejudice, but getting his attention and good-will—is a great accomplishment. There is charm in personality from which it is hard to get away. It is difficult to snub the man who possesses it. There is something about him that arrests our prejudice, and no matter how busy we may be, or how much we dislike to be interrupted, we rarely turn away a man with a pleasing personality. We must give much in order to get much; the more we radiate, the more generous we are, and the more we fling ourselves out to others, the more we get back. The current will not set toward you, until it goes out from you. What you get from others is the reflex of the currents you give out. The more generously you give, the more you get in return. In other words—as you pour out your personality, born of courtesy and kindness and the other character-forming virtues, so do you inspire respect and confidence, and invite from others a return of that which you give.

COURTESY ALWAYS PAYS.

Courtesy and consideration in every walk of life is now the accepted rule. No strong man lowers himself by giving somebody a lift, no matter who that somebody is. It may be an ignorant foreigner, unversed in our ways and language: or it may be an old man or woman, a cripple or a child—it matters not—and no time is lost, for the more people you rightly direct and the more intelligence and consideration you rightly lend, the more valuable will be your life. Many men fail because they do not see the importance of being kind and courteous. Kindness, consideration and courtesy to everybody always pays; and besides, it is a pleasure to be kind. It increases our store of happiness. I have seen men lose important positions and their reputations—which are more important than position—through their lack of courtesy to men to whom they did not think it was worth while to be kind. Beauty of character, charm of manner, attractiveness and power of expression, blended with courtesy, consideration and kindness, will open the door to any proposition, and our sincerity of purpose will clear the path of its many obstructions.

DEVELOPING PERSONALITY BEST INVESTMENT.

The final thought I wish to convey is, that no investment will give greater returns than cultivating your better self, and thereby developing that indefinable something called *personality.* There is nothing that pays so well as training our minds and thoughts along the lines of the beautiful and true. It matters not how well-versed we are in the material things of life, or how well we understand the lines we have to sell; we may be experts pertaining to technique or detail in connection with iron and steel products, or any other articles of commerce for that matter, but if we are not in harmony with Nature and Nature's order of things, we cannot make the success of our lives that we otherwise would. Being in harmony with Nature, brings us into harmony with all about us, and above all, it brings us into harmony with ourselves, and when this is so, and the physical is subordinated and ruled by the mental, life becomes full and complete. I fully realize I am painting an ideal picture, although not an impossible one,

(Concluded on Page 281.)

A Study of Mediaeval Iron Work

Revival Due to Influence of Architects on Design —Several Examples From Old English Buildings

Written for "Construction" by John Y. Dunlop.

THE modern revival of taste for, and the appreciation of the ornamental part of the smith's work, has continued to make great progress since our architects have pointed out the artistic capabilities of wrought iron.

At the beginning of the present century the art of the founder ruled supreme, with the result that for some time we were faced with tasteless rows of monotonous palisades, which were masterpieces of malformation and crude and monstrous in design.

But the art of the founder, whatever be the metal in which he works, can never hope to command the highest homage of a cultivated taste.

That is reserved for the article which owes its fitness and beauty to the skill of the hand, the artistic eye and the dexterously wielded hammer, it matters not whether it be iron or precious metal.

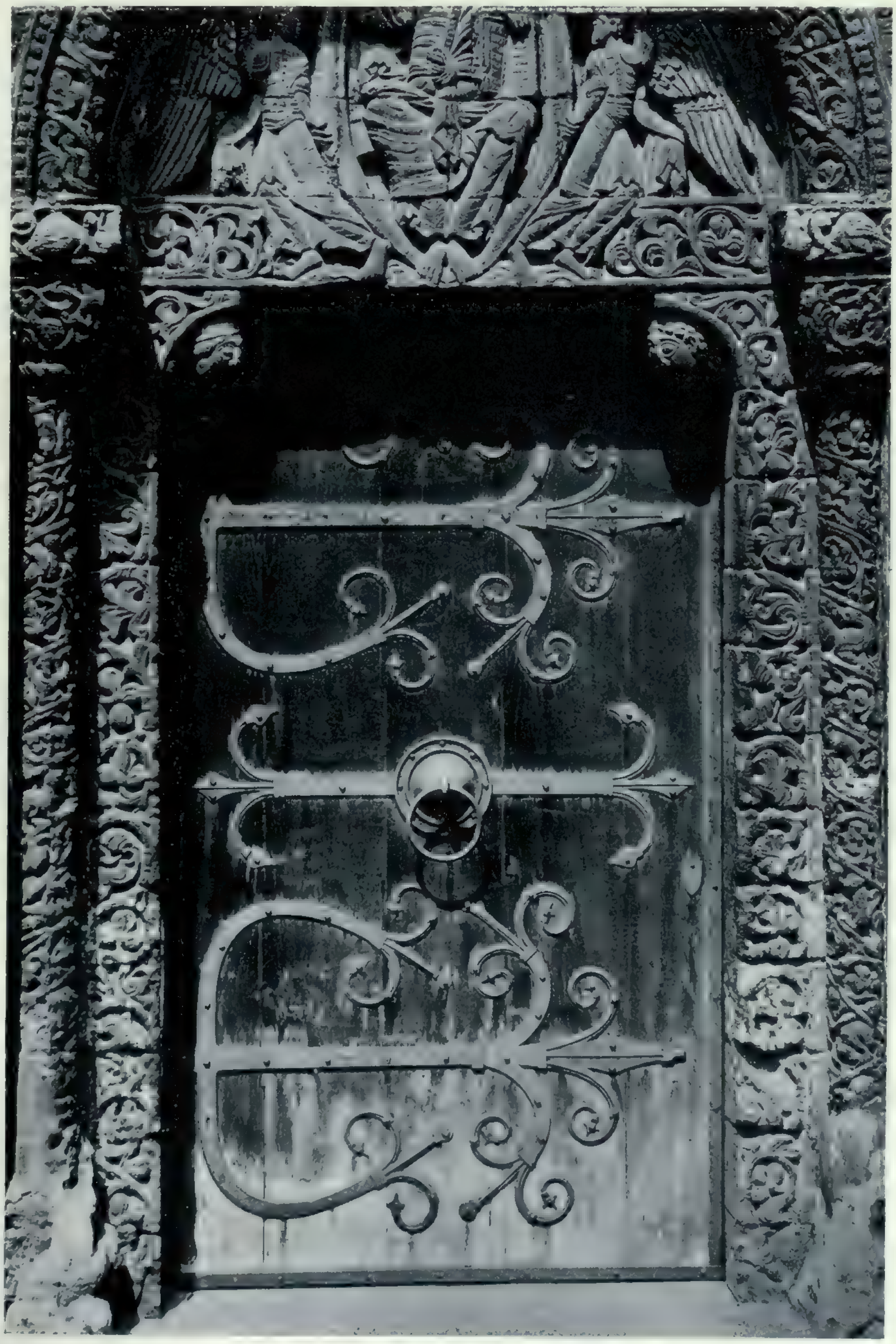
The application of artistic wrought iron work on mediæval lines has now been largely extended, with the result that we have to-day some very fine examples of gates and railings in almost every district.

How far the influence of those early artistic examples which we still have with us to-day has had on our present craftsmen it is very difficult to say, but there is no doubt that our present architects have learned much from the production of the hammer of the mediæval smith.

The ancient smith must have enjoyed a great number of advantages over the modern workman, who has to be content now to take bars of iron as they come from the rolling mill, and to at once convert it into a marketable article.

Long ago the country smith could only bring his iron into that state by repeated forging, and that is the sole reason for its tenacity and ductility when compared with the present time material.

The productions of the hammer of those early smiths were held in



ORNAMENTAL IRON HINGES, ELY CATHEDRAL, ENGLAND.

such high esteem that he could afford to give much time and care to those special fabrications.

In examining those interesting relics of ironwork which have come down to us we can only conjecture as to the means employed to produce them.

Still it is safe to say that the methods adopted by the ancient smiths were substantially those of the present day workmen. In actual work nothing has been more frequently represented than the door-hinge wherever any approach to architectural detail has been attempted.

These are usually strap hinges, with simple scrolls, but in many of our cathedrals the doors are to be seen with elaborate scroll work and ornamental strengthening pieces, and occasionally the entire door is covered with ironwork of great richness.

The half-tone illustration of the door hinges at Ely Cathedral is certainly a very elegant specimen of this class of early work.

It is a marvel of wrought iron stamped work, and together with the strengthening frame, which is round the door, is admired by all lovers of real smithy art.

ENTRANCE GATE, CLARE COLLEGE, CAMBRIDGE, ENGLAND.

How these things have been made is a matter of guess work, but it is quite likely that the master smiths would have a working drawing made with chalk on a large drawing board, and bend his scrolls in the scroll-wrench to the outline.

Possibly he would commence the hinge by making the centre part, then adding the side pieces and scrolls as he made them.

The frame which runs round the job and the hinges are welded together.

After the work had been framed up the metal would be stamped on the face.

To produce stamped work the smith has to strike the iron hot into prepared dies as wax is pressed into a seal, and by this means the designs on the face have been executed with the same minute carefulness as in carving on stained glass.

The secret of preparing steel dies was certainly known to the English at an early time, but a really lavish use of them was first made in France.

The frequent use of mystic figures are to be found in this class of work, and many interesting specimens are still to be seen in England.

Two of the many are to be seen at Stillingfleet, in Yorkshire, and at Staplehurst, in Kent.

The first has crescent hinges ending in serpents' heads, with an interlacing rope strap, and what appears to be a Viking ship with two figures.

The Staplehurst example is somewhat similar, but more confused.

Whether this fanciful ironwork was simply a notion of the blacksmith who wrought it, it is very difficult to say, but it may be said that the effort was both original and spontaneous, with a beauty and eloquence of form which has never been surpassed or equalled.

Another English development of smithing of an early type is seen in tomb railings, formed of plain and massive vertical bars, of which the spear-headed boundary railing is a descendant.

The date of their introduction is uncertain, but none now exist of a date older than those in the line drawings.

The oldest monument in which they are used is the tomb of the Black Prince, at Canterbury, in which the rail is supported with a heavy battlemented cornice, the vertical railing finished at the top rail.

At the corners the posts are forged with buttress projections, which are common to the early style of church architecture, and is carried above the top rail with a heavy forged moulded and spiked head.

In all the vertical bars the angles are placed to the front.

Soon after this tomb railing was designed the vertical members were carried upward and sharpened at the point in the form of spears, or barbed like arrow heads.

An example of this kind of guard is shown in Archbishop Langton's tomb in Westminster Abbey.

A marked departure from these two types is to be seen at the tomb of Sir Thomas Hungerford, in the chapel of Farley Castle, which has at the corners vertical bars with massive foliaged ends, a detail of which is shown.

The vertical rails are arranged alternately with small foliage and spear ends, which are fixed into plain rectangular bars, which are hidden by richly decorated straps, cut with a variegated edge, and stamped on the face.

A very little study of those early grilles show that they were not selected because they were admired beyond others, but solely because they offered the best kind of protection at that time.

From this time forth doorways, or openings in masonary, came to have the principal members of their grille formed of upright bars, and a careful examination of this kind of work goes to show that practical consideration, and not taste, very often dictated the railing form.

This is very much so in the beautiful Gothic double door at Ely, which has been fashioned with all the decorative features of the architectural time of the building.

The door itself is hinged to an iron frame set into a checked jamb, which has been recessed with a square opening.

Still the outline of the four-centre Gothic arch has been retained, and the same characteristic feature carried out on the door.

The outer frame of the door is seven-eighths of an inch square, while the intermediate vertical rails are five-eighths of an inch square, placed with their corners to the front.

At the top there is four pointed arches on each side, with their welded-in trefoil ornament.

The bottom rail, which is made of an upper and lower member, is filled in to represent quatre-foil ornament, while the middle horizontal rail is hidden by a moulded and stamped strip of iron on each side.

Every little detail of this grille has been forged in keeping with the style of ornament to which the church belongs.

We have also many fine examples of entrance gates at the various colleges in Oxford and Cambridge.

No other cities have such a variety of design, all of which show the utmost variety of treatment, and are often beautifully finished with the old traditions of mediæval smithing peeping out in every detail.

In the entrance gate at Clare College the grille is composed mostly of vertical members, with rows of decorative features at each horizontal rail.

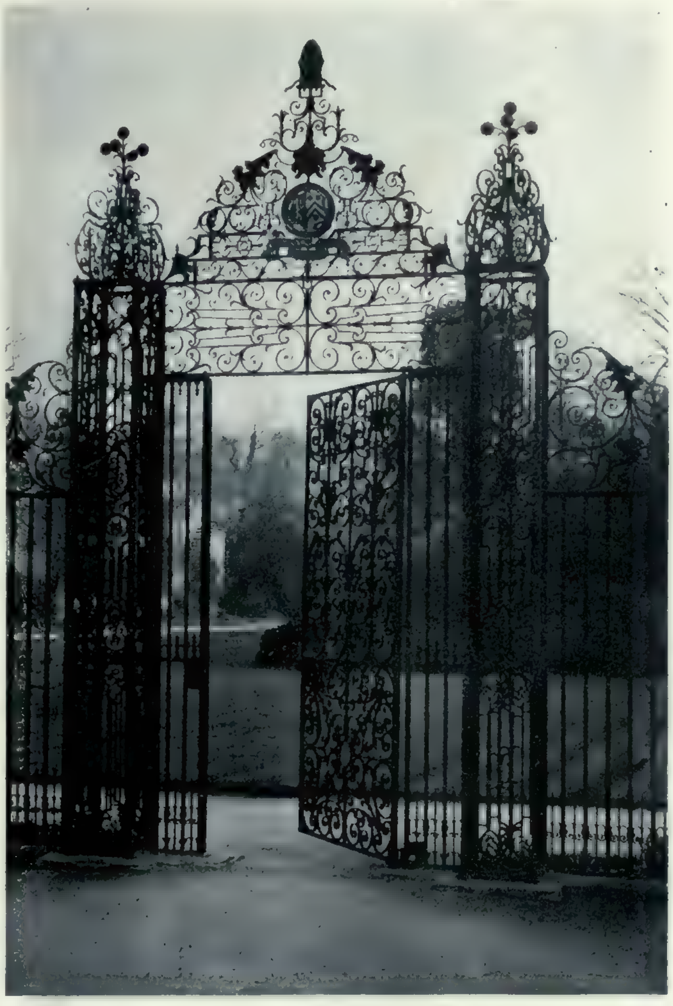
The elegant precision of the lines lend themselves aptly to the smith.

In the scroll work over the top the coat-of-arms of the college are inset.

This is bulged and stamped and riveted through from the back.

One of the finest productions of Oxford is the garden gate of Oxford's new college.

The main block of buildings occupying the garden court of this college was finished in 1684, and it is said that the design was in imitation of the Palace of Versailles, but it is more likely to have been suggested by Wren's work at the King's College, Winchester.



GARDEN GATE, OXFORD COLLEGE, ENGLAND.

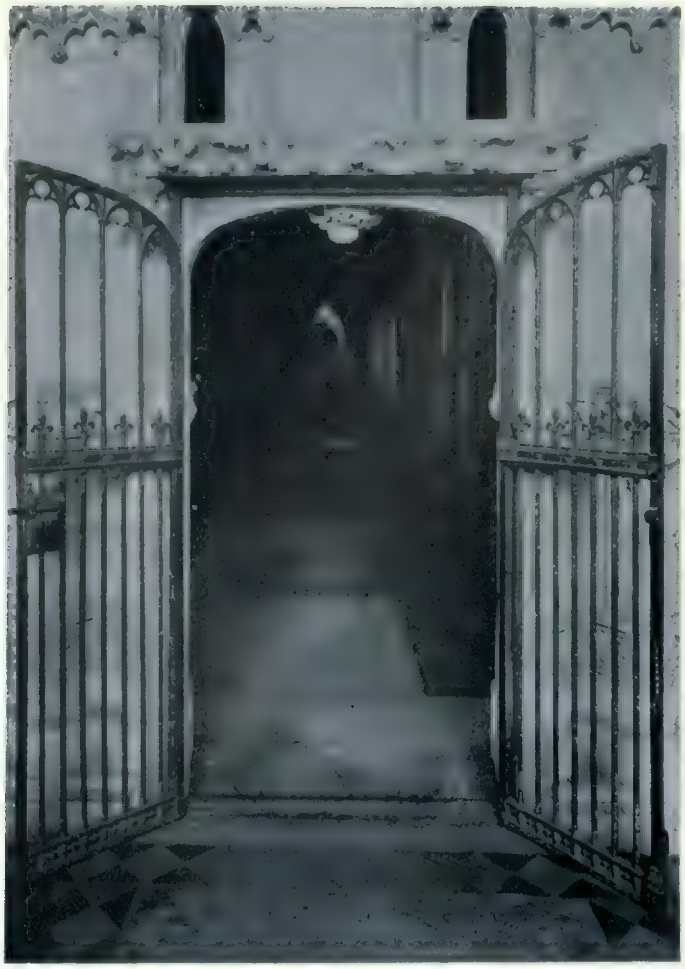
The courtyard is separated from the garden by an elaborate iron screen, over one hundred and twenty feet in length, which we are told was set up in the year 1711 by that ingenious artist, Mr. Thomas Robinson, Hyde Park, London.

An unusual amount of work has been put on the gate, which is richly decorated with scroll work.

The gate is in single leaf, with a plain part of the grille on each side, which is balanced with scroll panels running up past the ends of the frieze panel.

This beautiful ironwork is the result of well-balanced contrast of light open work, and by sheathing the scroll ends in thin grass-like leaves.

In the door we have a ribbon-like treatment



GOTHIC IRON DOOR, ELY CATHEDRAL, ENGLAND.

in each of the panels, producing the most effect with the smallest amount of labor.

It is scrolled up, bent into flowing and other outlines, and embellished with spirals or twists welded on and tied together at the functions.

The results are beautiful, and are not by any means as confusing as might be supposed.

The portion above the frieze is somewhat crowded, but the introduction of the arms and motto of the founder, William of Wykeham, Bishop of Winchester, has relieved it considerably.

The railing, which extends from each side of square wrought iron pillars, continues for a considerable length.

The smith of the middle ages had often to turn his skill to domestic constructional purposes, and to give expression to the thoughts of the designers of his age, with the result that his hammer and anvil were often employed to embody and gratify all sorts of fancies and ideas.

Sometimes it was the church; sometimes it was for the Lord of the Manor, from whom the request issued, with the result that in many districts isolated mediæval examples of the craft are to be seen.

Wrought iron porches are by no means common in England—still as an example showing to what extent the country smith had to pursue his operations it is an excellent one.

The design is light and graceful, and from what I have seen of it, it must have been forged as two corner posts, two wall posts, two intermediate posts, and then each of the frieze panels between.

Probably after being each completed in the smithy they would be riveted together in position, but on the whole the character of the work finds expression in thoughtful lines and superb finish.

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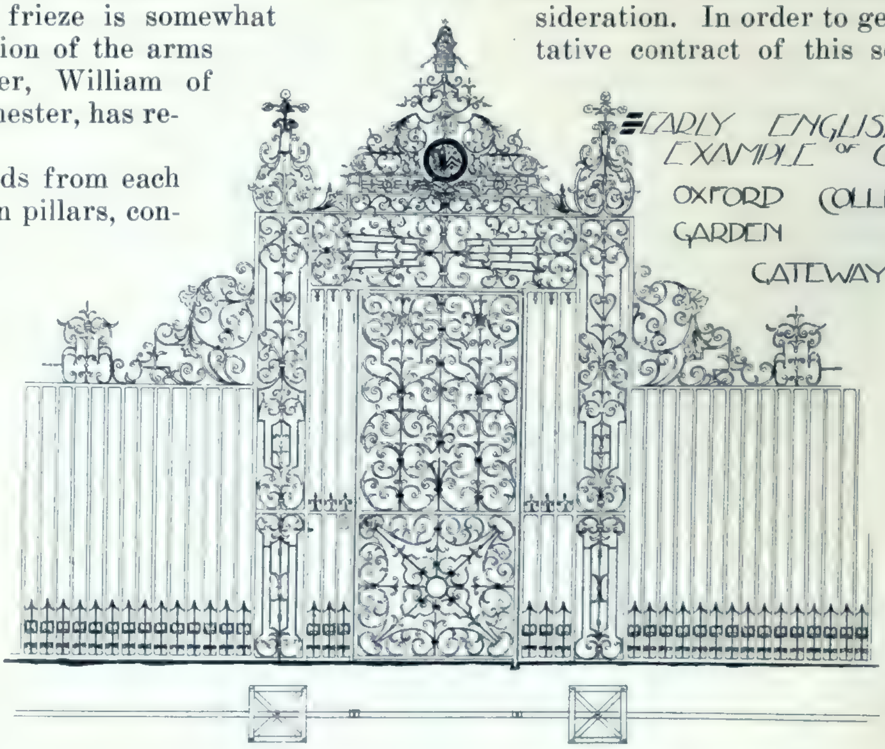
FRENCH WAR RECONSTRUCTION CONTRACTS

Many Canadian and United States companies are planning to undertake after-the-war contracts in France and other European countries, and the system of financing this work adopted by the Chamber of Deputies is, therefore, of interest. The general plan under which this after-the-war work will be done is as follows:

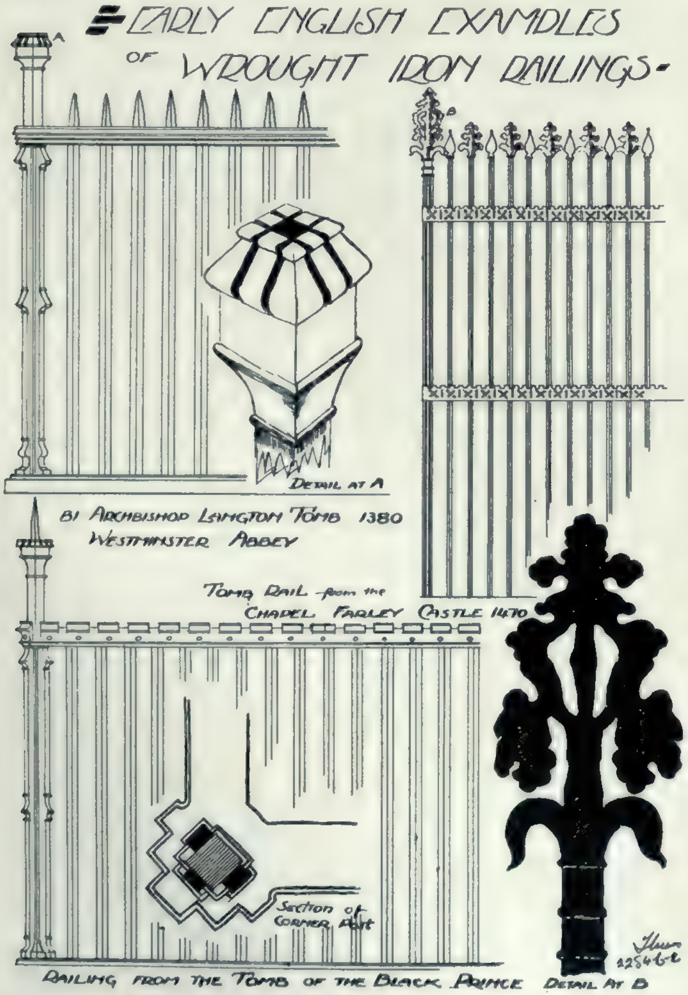
Each French city will ascertain through various committees the damage done to the property of the municipality, as well as to private parties. The Government will offer bonds for sale, the proceeds of which are to be used to furnish the money both to the municipality and to private parties. Contractors who are able to take contracts for the restoration of a city and take their pay in French bonds, to be disposed of by their own bankers, will receive the first consideration. In order to get a tentative contract of this sort the



EARLY ENGLISH EXAMPLE OF GATE – OXFORD COLLEGE GARDEN GATEWAY contractor must show through bank reference that he has behind him parties capable of placing a sufficient amount of bonds to do the work that he offers to do.

For instance, one of the largest cities which is now very much damaged and still is within reach of the long-range cannon of the enemy, will have about $3,000,000 of municipal work. This will consist of rebuilding the municipal buildings, streets and sidewalks, and other work of like character, while the private work will amount to between $30,000,000 and $40,000,000.

Another city, well within the German lines, expects to spend about $100,000,000 in its re-planning and rebuilding; the most of this they expect to pay for in bonds, and the remaining part in land well located at about fifty per cent. of the rental value. This is a very common method of doing large improvement work in European cities. As an illustration of this, Italy expects to practically rebuild five of its well known cities in this way. The city condemns the private property in the area to be improved, and fixes an appraised value on the land based on its present value.


EARLY ENGLISH EXAMPLES OF WROUGHT IRON RAILINGS
A
B
DETAIL AT A
BI ARCHBISHOP LANGTON TOMB 1380 WESTMINSTER ABBEY
TOMB RAIL from the CHAPEL FARLEY CASTLE 1470
Section of CORNER Post
RAILING FROM THE TOMB OF THE BLACK PRINCE
DETAIL AT B
1254b-e

WROUGHT IRON PORCH, WHITE HOUSE, CRAWLEY, HANTS, ENGLAND.

The proposition is to rebuild completely within the area mentioned, as all of it is in the heart of the oldest part of the city, the real business section. This whole area is then to be built up within a given number of years, and the city is to buy it and turn it over to one contractor at the price at which the city acquires it. The contractor can then sell it, or, if he prefers, rebuild it himself. In all cases, local banks will lend about two-thirds of the value of the real estate in its improved form. This is always sufficient, not only to pay for the land and the entire improvements on it, but it will allow for a fair margin of profit over and above the entire expense of the cost with the improvements. In addition to this, the city pays for the work on the streets, waterworks, telegraph and telephone lines, and all other municipal property. With this usually go most excellent concessions in streets, railways, ports, or other valuable income-bearing public property. For instance, a city in Italy has made an agreement for the execution of certain public works, including drainage, water supply, road improvements, etc., to the amount of about $5,000,000. The city guarantees four and one-half per cent. of the sum expended, of which one and one-half per cent. is to be refunded to the city out of future profits. The capital and interest will be secured by a mortgage on certain building sites of a value appraised at approximately $7,000,000, and by taxes on municipal income, drainage, and water, amounting in all to about $1,100,000 yearly.

The contractor in all cases is to furnish all the money, amounting to between $5,000,000 and $6,000,000. This contract, as in the case of all other municipal and governmental contracts, must be executed in the city or country where the work is to be done. The time for the execution of the work is given as six years, although the earlier it is completed the more profitable it will be, and the better it will please the city.

Clay Products in Engineering Construction

E. H. Darling, in an Address Before the Canadian Clay Products Association, Shows How Inferior Mortar, Poorly Drawn Building Laws, and Inefficient Labor Place Unnecessary Handicaps on Clay Products as Constructional Materials

FIFTY or sixty years ago there were very few of what could be called standard forms of building materials for engineering works. The engineer had not only to design his structure, but every detail of it, and then have the various forms manufactured specially for that structure. Gradually manufacturers grasped this engineering attitude, and got his viewpoint, and as occasion warranted, they employed their own engineers and technical men. They got together in one way and another and agreed on standards of forms, shapes, chemical and physical properties, and so forth, so that to-day the engineer has at hand a vast variety of standard material which he can specify with the same confidence as though it had been made specially for his particular work. This standardization of manufactured products was one of the great contributions which America made to the world's industry during the last century, and it has been a very important factor in the development of this continent.

WHERE A BROADER VIEW IS NEEDED.

However, it sometimes happens that the manufacturer of newer or smaller lines of products, intent on his own particular work, needs something to give him perspective—a broader grasp of what he is doing, and of the purposes to which his products are to be put. There is no doubt about it that there are many splendid ideas and valuable materials which now have no market simply because they have never been scientifically investigated, and their practical value demonstrated to such a point that engineers and other builders can specify them with confidence. It is in this field that the recently organized committee of scientific and industrial research will give valuable assistance. This is the basis of all engineering endeavor—the uniting of the theoretical with the practical—"applying the results of what has been learned everywhere to the matter in hand." And so it may yet be found that even in the manufacture of clay products, although of ancient origin and having seemingly simple process of manufacture, there are possibilities of development that are at present undreamed of. There is this reservation, however, if the product is for architectural uses, the manufacturer and engineer may do their best and fail, unless the results satisfy the requirements of the rules of architecture. These statements regarding the co-operation of the manufacturer and engineer have reference to the products themselves and to the uses to which they are put, but they are equally true when applied to the routine processes of manufacture. That is an entirely different branch of engineering, and while the writer is not in a position to make a sweeping statement, yet in one or two plants he knows of, they have hardly yet begun to apply the principles of efficiency which are doing so much for other lines, toward the cutting down of costs of manufacture and to the increasing of capacity.

Clay products perform many important services in all the various fields of constructive engineering. Their uses may not be as spectacular as that of some materials, but they are none the less most valuable. Clay, when properly treated, is a very poor conductor of heat and electricity, and very inert to chemical action, and most of its value in construction is due to these properties. The fact that it is a common material, widely distributed and found in a natural state, is because it is a stable chemical combination under all natural conditions of atmosphere and climate. When baked, burned or fused, it undergoes certain changes which tend to make it even more stable or inert to deteriorating chemical forces. All such other materials, as the metals, which are obtained by tearing them from the rocks by intense heat, or such as timber, which is built up by organic life, while stronger, hard and more elastic than clay products, they are not as stable, and they always have a strong tendency to return to their original state—to rust, decay, soften and disintegrate.

The writer has observed that in the carrying out of any important engineering work, the problems which call for the most careful attention and sound judgment are not so much those which have to do with the design of the body or main members of a structure, as those which relate to the stability of foundations and the protecting of the work against the destructive agencies of moisture and temperature of water and fire, corrosion and decay. For example, it is not a difficult matter to design a retaining wall, assuming certain conditions of foundation and backing, yet probably with the exception of dams, there is no class of engineering structure that has a larger percentage of failures than retaining walls. It requires better judgment—the outcome of experience—to so drain away the water which is likely to collect and alter the assumed conditions, than it does to design the wall. The same thing applies to road building and to foundations in general.

The electrical engineer would have no difficulty in high voltage transmission were it not for the problem of insulation. It would not be difficult to heat a building were the exterior walls perfect non-conductors of heat. All large sewers might be easily built of concrete, were it not for the fact that certain kinds of sewerage disintegrates Portland cement. All the study and thought put into the steel frame work of a sky scraper is rendered worthless in a few minutes if there has been carelessness in protecting it from fire. All these problems and many more like them, which in a sense may be called the finer problems of engineering, depend on clay products in the form of drain tile, insulators, brick, glazed tile, hollow tile, and so forth, for their solution. We use clay products for permanent construction, and where strength is essential we build a framework or skeleton of wood and steel, and protect them by a covering of the more durable material. It must be remembered, however, that what is true of clay applies more or less to certain other products of the earth, such as Portland cement, asbestos, mica, slate, and so forth, which also have their place in construction.

GREAT FUTURE FOR CLAY PRODUCTS.

But while clay products thus perform many services in construction, the end has by no means been reached. There is room for improvement in the way they are utilized, there are doubtless new uses to which they could be put, and besides, the demand for their use could be greatly increased. The following brief discussion will offer, from an engineering standpoint, a few suggestions along these lines.

The clay brick is one of the oldest forms of building material, and one would think that it must have long since reached its highest possible efficiency. It was used over 6,000 years ago in Mesopotamia, in the then fertile valleys of the Tigris and Euphrates, where an architecture of brickwork developed, based on the use of these small pieces of material. Thus, while in Egypt, and centuries later in Greece, roofs were supported by huge stone beams or lintels, the Ninevites were acquainted with the uses of the arch. These ancient builders, however, did not get very far, from an engineering point of view, for they apparently knew little of how to proportion a building for strength. Examples have been found of walls of great thickness for comparatively small buildings—one hall thirty-two feet wide, having walls twenty-six feet thick. It was the Romans who did more in the development of brickwork than any other people. They not only built their palaces, theatres and temples of it, but also their wonderful aqueducts and viaducts.

But common brickwork, as used to-day, when required to carry great loads, must be classed as a very inefficient material. Good, well-burned brick, has an average ultimate compressive strength of about one hundred and thirty tons per square foot, but when it is laid in lime mortar in the usual way, the average strength of the combination is not more than half of this. (70 tons). Here is a waste of fifty per cent. of the strength of the brick. It is only by the use of cement mortar that the value of the brick can be developed, for the strength of a wall depends on the strength of the mortar. Now, for any homogeneous material, such as steel, it is usually considered quite safe to allow a working stress up to one-fifth or one-fourth of its ultimate strength, but for brickwork conservative engineering practice does not permit more than one-tenth or one-twelfth, (7/8 tons). Thus to carry a given load we have to use two or three times as much brickwork as we would if we could have the same confidence in it that we have in steel. This is a further waste of the strength of the brick.

But there are still other handicaps put upon the use of brickwork which are not necessary. In some cities, the building by-laws will not allow even the conservative unit stresses given above, but fix the limit as low as four tons per square foot—about what is considered safe for solid earth. This means that in these cities, to carry a given load, the amount of brickwork must again be doubled.

SYSTEMATIC LAYING OF BRICK.

Now, approximately half the cost of brickwork is for the labor required to lay it. In this country we expect to pay masons at a somewhat higher rate, in proportion to that received by some other trades, because of the fact that there are four months in the year during which there is not much bricklaying done. In other words, we only use seventy-five per cent. of the available skilled labor of this trade. We are safe in saying, therefore, without casting any reflection on brick masons, that from an economic point of view bricklaying is not more than eighty per cent. efficient in Canada.

Something that requires more serious consideration is the claim made by Frank B. Gilbreth of New York, that by the elimination of waste motions and the adoption of systematic methods, the average mason can double his rate of laying brick.

Thus for every dollar we spend for brickwork, fifty cents is for materials and fifty cents for labor. For this latter half-dollar we obtain labor of which we only use forty cents worth and which it is possible to reduce to a cost of twenty cents. We are, therefore, getting seventy cents worth of brickwork for one dollar. But, as in some cities, we are required to use twice as much brick work as we need for strength, in such cities we only get thirty-five cents worth of strength for one dollar. The same by-laws will allow us to put about four times the load on plain concrete that is permitted on brickwork and the cost of concrete in piers and walls is approximately the same as brickwork. So for one dollar invested in concrete we will get about twelve times as much strength as we would from the same spent for brickwork; assuming that we get one hundred per cent. efficiency in the placing of the concrete.

These figures must not be taken too seriously, for they in no way express the true relative value of brick and concrete. They are given to emphasize the fact that there is room for improvement in the use of even the oldest of clay products, and that in order to successfully compete with other materials, the highest standard of product and efficiency in workmanship are essential. They also illustrate the evil effects of unreasonable building laws, but this will be referred to later.

WATER ABSORPTION QUALITIES.

One of the properties of burned (unglazed) clay is its ability to absorb moisture. This is a very useful property under some circumstances, but a very undesirable one for brick, the common variety of which will absorb as much as seventeen per cent. of its weight of water. Certain impurities in brick when acted on by water cause them to crumble. Water expands eight and a half per cent. with a force of about two hundred pounds per square inch, at the temperature of thirty-two degrees F., a temperature which we have on an average of sixty days a year in lower Ontario. It takes a pretty good brick to resist the action of water and frost for any length of time. Then too, lime mortar, unlike Portland cement, will not harden if kept moist, but loses its "life" and crumbles. For this reason many precautions have to be taken to protect brickwork from moisture or from contact with anything else which absorbs moisture, such as stone and concrete. It is well known that in this action which shows itself in the white effervescence, stain and disintegration that disfigure and injure so many buildings in which care has not been taken to interpose a layer of waterproofing between the brick and foundation, window sills, coping, and so forth. Partly on this account, and partly for architectural reasons, there has of late years been a growing demand for impervious brick. High class brick of this nature is being brought long distances, and fancy prices are being paid for it. There is also a noticeable extension in the use of glazed or vitrified material, all of which indicates a rising standard of construction.

In fireproof construction the principles of engineering are so greatly used that it is not more than necessary to mention the subject here. The desirability of this type of construction for large buldings, is admitted by all. But we have reached a point where fireproof construction can be used with splendid results for moderate size residences running from eight or ten thousand dollars in cost and up. In a well built house the extra cost is practically all in the floors and it is a comparatively small percentage of the total cost. While protection against fire is the point usually emphasized, there are many other reasons, sanitary and economic, in favor of this type of construction that in themselves are worth the extra cost. In fact, residences of this size built in the old way must now be considered second class, out of date, no matter how elaborate. How much more can this be said of schools and other large buildings.

In working toward this higher standard of building in which the construction features are entirely engineering, the engineer is closer to the manufacturer of clay products than the architect is. Those architects to whom the bulk of this class of residence work goes, make no claim of being engineers and it means a radical and expensive departure from their accustomed practice to undertake it. The owner on the other hand, knows even less about it, and, even if inclined to consider it, is easily discouraged by a hint at a great increase in cost. This is a field for fireproofing materials that has hardly been touched as yet.

FIRE LOSS PROBABLY DUE TO BAD CONSTRUCTION.

A great deal of effort has been put forth to awaken our people to the fact that our tremendous annual fire loss is for the most part unnecessary. Not only are there direct losses when a fire takes place, but the very fact that a fire trap exists depreciates all the property near it and adds a burden of insurance. But as yet, apart from the various and in many cases inadequate city by-laws, little if anything has been done toward a systematic campaign against this destructive element.

Great as our fire losses are, the writer would not be surprised if on investigation it should be found that the loss from poor building construction, not including that due to lack of fireproofing, is even greater. Take the losses due to the action of water alone, not considering that from freshets and failure of dams. Water being an almost universal solvent constitutes the best of mediums for chemical action. Its presence is also required for all the kinds of bacterial growth which attack organic substances. It is a fairly good conductor of electricity and is necessary for the phenomena of electrolysis. Buildings erected in the dry deserts stand unchanged after four thousand years, while in our climate they would practically disappear in one-tenth of the time. So in addition to the waste from the mechanical action of water, such as the back flooding of poorly designed sewers, the undermining of foundations, the heaving effects of frost, the damage to property from leaking roofs, and so forth, we have the disintegration of brickwork, as mentioned above, the rusting of metals wherever exposed or subjected to electrolytic action, and probably the most important of all, the decay of untreated and unprotected timber.

In the form of snow and ice, water does an immense amount of damage, but as a great deal of this is unavoidable, it cannot all be charged to poor construction.

WASTE DUE TO CITY BY-LAWS.

Another cause of waste is that referred to above—the unscientific and sometimes absurd requirements of the building by-laws of many cities. Conditions imposed in some cases are made so arduous as to be prohibitive and actually put a premium on the poorer type of construction. It was estimated (by C. R. Young, Can. Eng. Feb. 26, 1914) that the 1913 building by-laws of Toronto, entailed an average annual waste of a quarter of a million dollars by unreasonable structural requirements. Any legislation that requires an extravagant use of any article or material so adds to the cost of a building—often in a greater proportion than the cost of material itself—that instead of increasing the demand for it, it actually has a tendency to restrict its use and favor its competitor.

But the waste of wealth throughout the country due to faulty construction must be enormous. Every high wind or heavy snowstorm levies its toll of damages. How much of this is unnecessary, it is impossible to say. Every thunderstorm leaves a path of destruction behind it, and yet it has been demonstrated of late years that danger from lightning can all but be eliminated by the intelligent use of lightning rods.

There are smaller and indirect items of waste, such as is due to the poorly constructed small house where a few extra dollars spent in making it weather tight would be paid for many times over in the saving of fuel to heat it. Thus the subject gradually shades off into other economical problems which have to do with the sanitary, commercial and industrial welfare of the nation.

In the light of present day knowledge a large part of all this loss from fire, water, and waste, is unnecessary, if not criminal. It remains for ways and means to be devised that will restrain the careless, protect the ignorant and to supplement, and encourage the efforts of individuals to reach a higher standard of construction. What the Municipal and Railway Board is doing for our municipalities, what the Provincial Board of Health is doing for sanitation and public health, what the Hydro-Electric Commission is doing for good electrical installation, what we expect the Town Planning Act will do for our cities, that we need for building construction.

And the honest and efficient manufacturer of clay products may rest assured that the broader application of the principles of engineering to construction will mean an ever increasing appreciation of all his lines that enter into construction work.

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CANADA'S SELLING PROBLEM AFTER THE WAR

(Concluded from Page 272.)

and while we may not rise to the height of this ideal, we can, by following it, at least go part of the way, and this part, no matter how small, will take the place of some discordant element, which would retard our success. Therefore, I recommend that you try to open your mind and heart to the wonderful influences of Nature—the beautiful and true. Realize your oneness with her and partake of the inspiration and power she imparts. Implant firmly in your mind the successful man you wish to be, and so will you become, for it is the vision we hold in our mind—the ideal that is enthroned in our hearts—that we build our lives by. This we will become. It is the beauty of our thought, the quality of our minds and ideals that make the man.

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M. Pierre Paris has announced to the French Academy of Inscriptions the discovery of what may prove to be a second Pompeii, buried under the sands of Morocco. In carrying out excavations in the region of Bolonia, on the sea coast, M. Paris first came across an ancient factory, believed to have been established for the salting of fish, and more particularly perhaps of the tunny fish which abounds in those waters. This factory was indisputably of Roman origin, as proved by the style of the columns and marks upon them, careful photographs of which have been taken. Further search revealed on a vast terrace dominating the sea a big house obviously contemporaneous with the factory. The atrium of the dwelling has been completely cleared, and is surrounded by vestibules and chambers, a sketch of the plan of which had been executed. M. Paris says that this is merely a beginning, and that he is convinced a whole town in an exceptional state of preservation can be unearthed.

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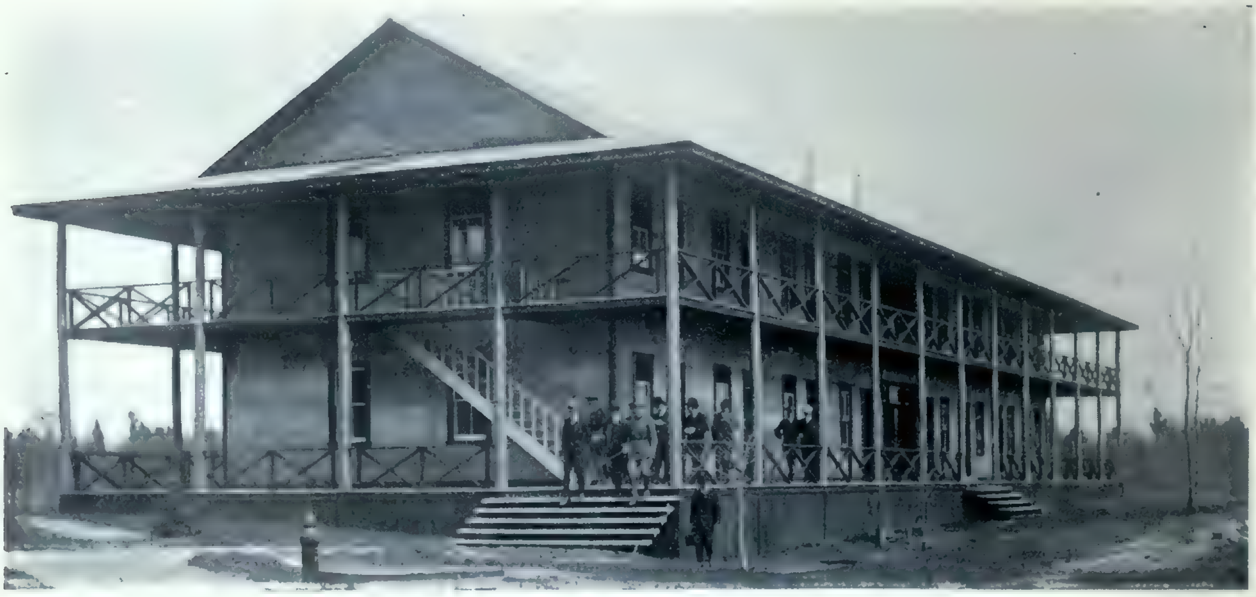
Visitor—"So this is the deaf and dumb ward! How do you call people to dinner? I suppose you don't ring a bell."

Superintendent—"No. We have a man who walks through the ward wringing his hands."

A SCENE NEAR MICHELHAM HOME FOR CONVALESCENT CANADIAN OFFICERS, FRANCE.

A HERBACEOUS BORDER IN GARDEN OF MR. GORDON OSLER'S LAKE SIMCOE RESIDENCE.



HEADQUARTERS OF THE R. F. C. AT CAMP HOARE, BORDEN.

CONSTRUCTION

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WESTON WRIGLEY - Editorial and Business Manager

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Garden Cities For France

That it is an ill wind that blows no good is again proved in the possibilities set forth by the action of the French Chamber which has adopted the principle of indemnities in full to property owners for the amount of their losses by the war.

The benefits that will accrue through such a policy will not, as might at first appear, be to the individual property owner, but more largely to the general public. Nationalization, or State ownership of land, decentralization of the population and the replacing of ruined towns by well planned garden cities, are among the principal topics now under discussion for the rebuilding of Northern France. Those who strongly urge the adoption of a measure of indemnity are as strongly in favor of the State's availing itself of an opportunity to take over certain lands, and thus to carry forward on the largest scale, experiments in the formation of garden cities.

These experiments, as is further pointed out, are at the outset assured of success, and as an instance of what can and probably would be accomplished, Dravoll, an experimental garden city, in the department of Seine and Oise, is referred to.

The success of this venture in co-operative housing has been so great as to cause many men who have tried to discredit such attempts to become the most enthusiastic supporters of the scheme for garden cities, now proposed by the French Government.

Dravoll started in 1909 with a capital of $4,000, and it now has a capital of $160,000 in which about three hundred families are interested.

The project as outlined for the rebuilding of the devastated area in the North of France, and which could be placed in practical operation if the proposed legislation is passed, comprehends that when the State has taken over the land by purchase, it may be leased to the different Communes which in turn would let it to societies formed on a strictly co-operative basis, or directly to individuals.

The improvement of the land in every case would need to comply with certain restrictions preventing too great concentration of population, and the setting apart in every settlement of such spaces as would provide public parks and playgrounds, the whole development to have the most improved hygienic installations.

A scheme of this sort would result, if properly conducted, in restoring a devastated section to habitable conditions, and affording an opportunity to carry forward on a large scale, ideas of co-operative town planning that have never before been attempted.

The result of this effort toward rehabilitation of that section laid waste by war will, as pointed out by the "American Architect," be watched with considerable interest.

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Military Hospitals a Live Topic

The September number of CONSTRUCTION will be devoted almost exclusively to a description of the work of the Military Hospitals Commission in Canada in providing hospital accommodation for the thousands of wounded and disabled soldiers returned to Canada after having served their country on European battlefields.

With very limited accommodation available at the beginning of the year, mostly in old colleges and other reconstructed buildings, Canada now has military convalescent hospitals already completed, or in course of erection, accommodation for about fourteen thousand patients, while Capt. Symons, and the architectural and engineering staff of the Hospitals Commission, are working almost night and day to still further increase the accommodation.

In this number several articles are devoted to hospital construction in France and the United States, and this information, coupled with the data to be given in CONSTRUCTION for September, will be read with interest by all who have at heart the proper caring for of the disabled men who have fought their country's fight and have been returned to Canada for recuperation and reconstruction.

Efficient Heating For Institutional Groups

A. L. Baum Outlines the Advantages of Central Heating Plants for Hospitals.

THE present tendency in the design of our large institutions leans towards the village idea, i.e., a number of separate dwelling houses, interconnected by pleasant walks and passageways, and a few central buildings for service and administration purposes, the whole so arranged that it usually spreads over a considerable area. Generally speaking, sufficient funds are not at first available for the completion of the entire group of buildings as planned, but provision is usually made in such cases for future extensions and additions.

In serving such a group of buildings with heat, light, water and power, the general aim is toward the centralization of service. The advantages of such a central plant are so well known, and have been presented so frequently, that I need not review them again. I shall take them for granted, and shall use the central plant as a starting point for this discussion of the type of heating system best adapted to such a group of buildings. It is obviously important that such a heating system be simple, reliable and effective. Good and healthful living conditions are vitally connected with proper heating. An error in the determination of so important a feature is most serious, and likely to result in tremendous expense if a rectification of that error is to be made at a later date.

The central plant having been determined on, the two possibilities as mediums for heating are steam and hot water. In order to more clearly understand the nature of the problem, let us consider a layout such as shown in the diagram, which represents a large institution of the hospital type, with isolated buildings. The distance from the power house to the end of the group is seen to be about 2,500 feet, almost one-half mile, and institutions have been designed, such as Letchworth Village for the Feeble-Minded, at Thiells, N. Y., where this distance exceeds a mile.

Whether steam or forced hot water is circulated as a means of heating the buildings, some exhaust steam will be available from the engines or turbines of the central generating plant; usually, however, not nearly enough for the full heating load. With a back-pressure on the generating units of not more than 3 or 4 lbs., it is evident that the exhaust steam, even if enough were available, cannot be used for heating the far buildings. These, if steam heated, will have to be served with high-pressure steam, reduced in pressure at the buildings, which will at least permit the use of smaller distributing mains.

Economy demands that the condensed steam be returned to the boilers in the central plant. The facility with which this may be done with steam heat depends largely on the relative levels of the buildings. A gravity return system is by far the cheapest. If this is not possible, a vacuum return line system may sometimes be utilized. But here, again, not only are proper grades essential, but the distance from the last building to the central plant must also be considered. A last resort for getting back the heating returns (where relative levels forbid the use of either of the foregoing methods) is the system of pumping, and this means a number of return pumps scattered over the property, which must be provided with power, either steam or electric, and which also demand frequent attention both as to operation and maintenance. Such an arrangement materially decreases the advantages of the central heating plant.

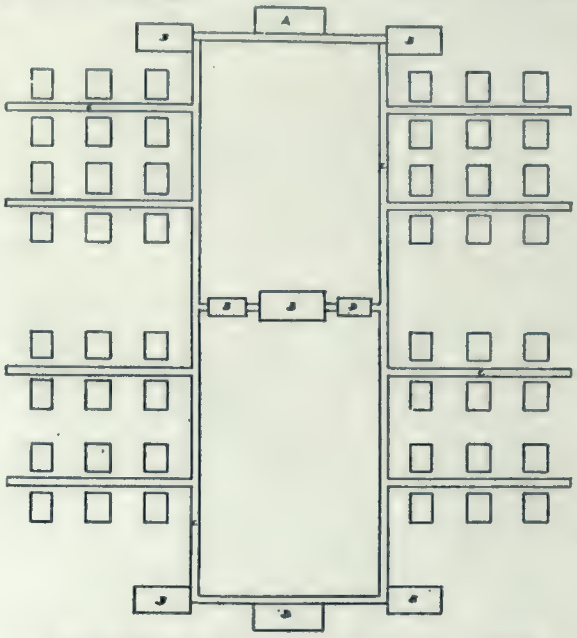
Hot water as a heating medium, however, is not subject to such great restrictions. The water can be pumped regardless of grade, so long as proper provisions are made for relieving the entrained air from all high points where it may otherwise accumulate and cause air-binding of the mains. The water is heated in the central plant, easily utilizing (with a medium back-pressure) exhaust steam, which, as steam, could not be made to reach the farthest buildings. In plants of this kind the heating load is usually much larger than the power load. Under such conditions all the exhaust steam available during most of the heating season can be used directly for the hot water heating equipment; furthermore, the water of condensation is immediately regained without the slightest inconvenience. By no other distributing system can the heat be distributed with such little difficulty.

It is at once evident what a great advantage is effected by the central control of the hot water heating system. The operating engineer can at all times watch the temperature of the outgoing water, and vary it to suit varying weather conditions. During very severe weather the water may readily be heated as high as 200 degrees F. (or even a little higher), thus giving out a large quantity of heat from the radiators and stacks in the buildings. As the weather becomes milder, the water temperature is reduced accordingly, thus cutting down the amount of heat supplied to each room in proportion to the decreased demands of the outside weather conditions.

With steam heat, overheating of the rooms is almost unavoidable, since the steam temperature in the radiators is nearly constant, regardless of weather conditions. The method usually followed in practice to avoid overheating in mild weather when a little heat is still required is to open the windows; this means, in effect, dumping out of the windows the equivalent of a large part of the coal consumed. One method of saving much of this waste is to use thermostatic control in all the scattered buildings; but thermostats are delicate instruments, and are also expensive, both to install and to operate. Tampering with them does them no good, and, where it is desired to make simplicity the keynote of design and operation, delicate instruments, scattered all over the building should be avoided. Another method of effecting coal economy is the use of a vacuum-return or open-return line system, with fractional steam control, and automatic return valves on the radiators. But the necessary appliances are expensive to install, involve care and maintenance, and require the frequent manipulation of hand valves all over the institution.

The hot water heating system, on the other hand, by its variation of water temperature avoids the need of thermostatic or other scattered means for controlling the temperature of the rooms. It therefore eliminates from the buildings all mechanical devices, with the exception of one or two automatic air traps in each building and a hand valve (which need rarely be touched) on each radiator. By means of this central control, and its ability at all times to avoid overheating the buildings, the forced hot water heating system secures the maximum of fuel economy with the minimum of mechanical elaboration and of attendance.

Besides avoiding the loss due to overheating of the rooms, as just explained, the hot water system has considerably smaller radiation losses from the distributing mains than any of the steam systems. With the forced hot water system the maximum losses from this cause occur in the coldest weather, when the maximum water temperature is carried. As the weather becomes milder, the water temperature is lowered, and this in turn decreases the radiation losses from the mains. Steam, however, does not recognize changes in the weather. Whether the rooms are controlled by thermostats or by hand, or by open windows, the heating mains carry the steam continuously at a high temperature, since the temperature and pressure of steam are related by physical laws beyond the control of man. Hence the radiation losses, instead of becoming materially less in mild weather, as is the case with hot water, remain fairly constant throughout the heating season. The excess of these losses in the steam plant over those in the hot water plant for the same particular group of buildings may easily amount to several hundred tons of coal per year, depending on the size of the institution and the distance apart of the buildings.



BLOCK PLAN OF INSTITUTION OF HOSPITAL TYPE, WITH ISOLATED PAVILIONS.

A—Central boiler house and power house.
B—Administration and service buildings.
C—Interconnecting passageways for pavilions.

The foregoing considerations have been presented from the point of view of operating costs. Coincident with operation are the costs of maintenance. The greatest part by far of the heating equipment of a large group of buildings on a widely extended area is the piping connecting all the heating surfaces with the source of heat in the central plant. In the steam heating system this entire network of piping carries during the heating season a mixture of steam, air and moisture, while during the summer it remains dry and empty. With the forced hot water heating system the piping can remain at all times filled with water, from which practically all dissolved air has been expelled. It has long been known that piping does not rust out nearly as rapidly while it remains filled with such water as when in contact alternately with air and moisture. This gives the hot water system the advantage of much longer life, and longer life means a cheaper maintenance and depreciation charge, as well as less trouble from repairs.

There is still another phase of this question which, from a physician's point of view, should be important—namely, the health aspect of heating systems. Investigations have shown that particles of dust (largely organic matter) carried in the air begin to "burn" or decompose at about 165 degrees F., and, since the temperature of the steam-heated radiator is always much higher than 165 degrees F., it is at once evident what is taking place in a hospital ward heated by such radiators. The consistently lower temperature of the hot water radiators avoids in almost all cases this irritating annoyance from decomposing dust. It therefore secures a heating effect which is at once the more healthful of the two possibilities, and also affords a much more even temperature in the rooms due to the much lower intensity of radiation from the lower temperature radiators.

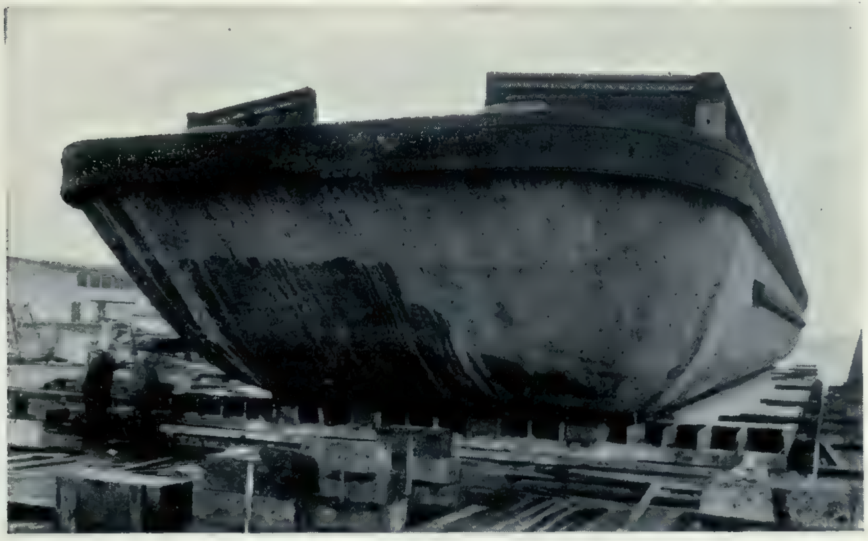
The only statement that can be made against a forced hot water system in favor of a steam heating plant for a group of buildings as herein shown is a possible slightly increased first cost of the hot water system. As opposed to this, however, are (1) the advantages of central control of the heat, (2) the simplicity of installation and operation, (3) the economy effected by avoiding overheating of buildings, (4) the economy effected by decreased radiation from the heating mains, (5) the longer life of the heating equipment, and (6) the more healthful character and more even distribution of the heat in the rooms, all of which go very far toward making forced hot water the ideal heating medium in a plant which proposes to be an effective and economic investment for the community as owner.

Will Build Concrete Ships to Defy Submarines

OUR country is confronted with the problem of increasing the merchant marine, and it requires the consideration of every possible method or material of construction. Several prominent engineers have suggested reinforced concrete.

A San Francisco firm of engineers is designing a ship with a length of 330 feet, a beam of 44 feet and a depth of 31 feet, with capacity of 4,500 tons—to be built of reinforced concrete. A concrete schooner was employed for some years in the North Atlantic coasting trade, having been constructed in about 1898. The London "Times" mentions a small boat of reinforced concrete built by a Frenchman in 1849, and still in service after a test of 68 years.

The concrete ship is only a further development of the concrete barge, and such craft have been in successful use for years. Concrete lighters have been used for the past six years on Chesapeake Bay, supplying coal and water to dredges, carrying loads of sand and gravel, etc., and the accompanying illustration of a 500-ton lighter on the ways just before launching is typical of their appearance. With such a craft there is no necessity for caulking or painting, the upkeep is small, and there is no danger of decay. Barnacles will not collect on a concrete hull.



FIVE HUNDRED TON CONCRETE BARGE BEING LAUNCHED.

A concrete barge has been in service on the Welland Canal since 1910, and has seen very hard usage. It has a length of 80 feet, a beam of 24 feet, and is 7 feet deep. It is interesting that the walls, which were constructed between forms, are 2½ inches thick, reinforced with steel rods, yet the barge is used for carrying loads of stone, etc., with conspicuous success.

Since 1910 reinforced concrete barges have been built for use on the various sections of the Panama Canal, and their experience has enabled the engineers to develop a very efficient type of vessel. Recently concrete pontoons were constructed for service as landing stages for boats up to 65 feet in length. These pontoons have a length of 120 feet, a beam of 28 feet, and are 8 feet deep. They are very thoroughly reinforced.

Vessels which are more like ships than barges have been built of reinforced concrete in Norway. A report from the American Consul-General at Christiania describes a plant at Moss, Norway, where vessels of 3,000 tons displacement are being constructed.

A Boston writer suggests a plan which makes little if any change in the outward appearance of our modern steel ship, except that the structural part of the ship is of a specially prepared emulsified concrete reinforced with a fabricated network of steel rods that bonds the ship together in every part, giving great strength, and making the structure one continuous monolith. All decks, bulkheads, partitions, etc., are interwoven together in one continuous mass of steel and concrete. The ship has two hulls and a double bottom; the double hull runs to above the water line all around the ship. There is a space of 3 feet between the outer and inner hull, which is divided every 12 feet, making a continuous number of watertight compartments 3 feet by 12 feet girding every part of the ship to above the water line. In the centre of this 3 feet space is a system of fabricated steel rods looking somewhat like a heavy wire fence; the purpose of which will be explained later. This space between the double hulls and double bottom is not wasted, but being watertight, is used as storage tanks for carrying oil cargoes and for storing fuel for the ship's engines, the vessel being driven by oil engines, requiring a much smaller crew than a steam driven vessel, and giving more space for freight.

The designs and methods of fabricating the steel reinforcing rods is such as to make a ship strong enough to resist the heaviest sort of a gale without straining herself, yet no attempt is made in this plan to build the outer hull heavy enough to resist the explosion of a torpedo; so let us suppose such a ship is struck by a torpedo fired from an enemy submarine; the force of the explosion is so great that a hole two or three feet in diameter may be shattered in the outer hull, and now appears the use for the fabricated rods (or strong wire fence) inside the space between the two hulls.

These rods work on the same principle as Mr. Maxim's gun silencer, they dissipate, or in other words, break up the force of the explosion; at the same time they protect the walls of the inner hull from being damaged by flying pieces of the concrete; thus a section 3 x 12 feet is damaged, and its cargo of oil is thrown against the force of the explosion, but this of itself helps to cool the hot gases caused by the explosion; each 3 x 12 foot section is vented at the upper deck with a hatch that opens outward to let the explosive gases escape. The torpedo has now done its worst, and the ship has lost a few hundred gallons, maybe, of fuel oil, but the damage can readily be repaired in a few hours on arrival at her destination ,or even while at sea if necessary, as concrete will set in water without decreasing its strength.

It will also be seen that if a vessel of this kind should be damaged by collision or by striking a rock or an iceberg, only her outer hull could be damaged, while her freight and passengers are carried to their destination in safety. A few of the items to recommend such a vessel are:

First. A stronger and more durable sea-going vessel at less cost.

Second. Can be built in one-half the time required for a wood or steel vessel.

Third. An absolutely fireproof structure.

Fourth. A vessel practically free from vibration, greatly adding to life of machinery and comfort of passengers.

Fifth. A saving in up-keep; the hull. all outside and exposed surfaces can be of white cement, effecting a large saving in painting, etc.

Sixth. The attainment of graceful lines and good design at no added cost, owing to the flexibility of the material while in its plastic state.

Seventh. A powerfully, strong hull with an outer surface as even and smooth as glass and proof against barnacles and corrosion.

Eighth. The arrangement of a series of watertight compartments that will make the vessel practically unsinkable.

In view of such examples proving the usefulness of concrete vessels of this character, it would seem wise to consider concrete in the construction of ships which are to increase our merchant marine to the proportions demanded by the present requirements. If seagoing barges were to be constructed, or smaller craft suitable for lake traffic, this would release for other purposes many ships now in use in this capacity. The presence of the necessary materials for a concrete vessel at so many convenient locations would make it possible to provide a large tonnage, and progress in construction would be faster than with ships of steel, or even wood.

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TRADE NEWS,

The American Steel Export Company has appointed Woodburn's, Limited, Montreal, as their exclusive agents for the Provinces of Ontario and Quebec.

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FIRE LOSSES.

Glencoe, Ont.—The flour mill of the Woodburn Milling Company was destroyed by fire; loss $40,000.

Ingersoll, Ont.—The factory of the Ingersoll Machine Company was destroyed by fire.

Kelvin, Ont.—The Methodist Church of the town of Kelvin was destroyed by fire.

Kitchener, Ont.—The Romo Theatre was destroyed by fire; loss $5,000.

Osnabruck Centre, Ont.—The town hall of the Township of Osnabruck was destroyed by fire.

Rodney, Ont.—The planing mill, storehouse and office of John A. McIntyre were destroyed by fire; loss $6,000.

Strathroy, Ont.—The factory of George Rivers was destroyed by fire; loss $40,000.

CEMENT SCOW IN OPERATION ON WELLAND CANAL.

Canadian Building and Construction News

New Structures to be Erected—Contracts Awarded for Large Works—Trade Literature Issued—Other Items of Interest

BUSINESS BUILDINGS.

London, Ont.—Architect H. C. McBride, Richmond street, is preparing plans for an office building for Hobbs Manufacturing Company, to cost $10,000.

Toronto, Ont.—The Dominion Bank, King and Yonge streets, are erecting a bank building at the corner of Yonge and St. Clair, to cost $25,000, and their architects, Darling & Pearson, 2 Leader lane, have awarded the following contracts: Mason, Witchall & Son, 156 St. Helen avenue; carpenter, F. Markham, 51 Orchard View Boulevard; roofing, G. Duthie & Son, 30 Widmer street; plastering, R. C. Dancy, 153 Spadina road; painting, J. McCausland & Son, 11 Nelson street; plumbing and heating, Purdy, Mansell, Limited, 63 Albert street; marble and tile, Canada Glass, Mantels and Tile, Limited, 328 Carlaw avenue. The Canadian Hanson Van Winkle Company, Morrow avenue, are erecting an office building, garage and dwelling at the corner of Morrow and Silver avenues, to cost $10,000, and their architect, F. S. Mallory, 65 Adelaide street east, has awarded the roofing and galvanized iron contracts to H. S. Smith, Crawford street. The Royal Bank, King and Yonge streets, are erecting a bank building on Yonge street, to cost $25,000, and their architect, F. S. Baker, Bank of Hamilton Building, has awarded the following contracts: Mason, brick and concrete, R. Chalkley & Sons, 34 Victoria street; ornamental iron and steel sash, McGregor & McIntyre, 1139 Shaw street; carpenter, A. Weller & Co., 54 Tecumseh street; plastering, Hanna & Nelson, 273 Rusholme road; roofing, Douglas Bros., 124 Adelaide street west; heating and plumbing, W. J. McGuire, Limited, 91 Jarvis street; painting, J. McCausland & Sons, 11 Nelson street; wiring, A. R. Rice & Co., 152 Bay street; composite floor and tile, Italian Mosaic and Tile Company, 429 Spadina avenue; dumb waiter, Turnbull Elevator Manufacturing Company, 126 John street.

CIVIL ENGINEERING.

Kincardine Township, Ont.—The Kincardine Township Council will erect four concrete bridges, to cost $1,000, and have awarded the general contract to Bert Duke and John Godwin, Kincardine.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Orillia, Ont.—The town of Orillia contemplates the erection of a memorial hospital, to cost $50,000. This building will be erected at the close of the war.

MISCELLANEOUS.

Fort William, Ont.—Davidson & Smith, Port Arthur, are erecting a flour and feed mill on the McKellar property, to cost $100,000, and have awarded the general contract to Barnet & McQueen, Fort William.

Hamilton, Ont.—F. A. Ward, 108 Campbell street, is erecting a garage on Roxborough and Dundas street, to cost $10,000, and have awarded the general contract to W. C. Coulter, London street. The Semet Solvay Company, Syracuse, N.Y., contemplates the erection of coke ovens at the Stipes Inlet, to cost $2,000,000.

London, Ont.—The London Engine Supplies Company, 85 Dundas street, are remodeling their garage on Dundas street, to cost $5,000, and have awarded the general contract to Tambling & Jones, 282 Horton street.

Niagara Falls, Ont.—The city of Niagara Falls are erecting a firehall at the corner of Walnut and Kitchener streets, to cost $20,750, and their architect, C. M. Borter, 103 Main street, has awarded the following contracts: General, Ireland & Dinham, Glenholme avenue; painting and glazing, W. J. Mullen, 222 Victoria avenue; electric wiring, Niagara Electric Company, Victoria avenue; plumbing, Reid Bros. Company, Fourth avenue.

Ottawa, Ont.—The St. Patrick's Orphan Asylum, Laurier avenue, are erecting a boiler house and stack, to cost $13,500, and their architect, H. H. Tucker, Ottawa, has awarded the general contract to E. Monette, 60 Sterling avenue. Thomas A. Stott, Wellington street, is erecting a garage on Wellington street, to cost $5,000, and has awarded the concrete work contract to H. Haley, Chapel street.

Sarnia, Ont.—Architects James, Louden & Hertzberg, Excelsior Life Building, Toronto, are preparing plans for a brass foundry for the Mueller Manufacturing Company.

Sarnia, Ont.—The town of Sarnia contemplates the erection of an incinerator plant, to cost $25,000.

Toronto, Ont.—The T. Eaton Company, 190 Yonge street, are erecting a garage on Alice street, to cost $6,000, and have awarded the general contract to Thomson Bros., Ryrie Building. The British Forgings, Limited, Royal Bank Building, are preparing plans for temporary buildings to be erected on Atlantic avenue, to cost $15,000. The Imperial Oil Company, 56 Church street, are preparing plans for a fuel oil tank, to cost $70,000. The Willys-Overland, Limited, Weston road, are erecting a machine shop on Weston road, to cost $15,000. The Danforth Day Nursery, 859 Carlaw avenue, contemplates the erection of a nursery building, to cost $6,000. H. L. Bowles, 7-9 King street east, has purchased a site at the corner of King and Bay streets for the erection of a lunch room or a restaurant building. Gunns, Limited, Gunns road, have prepared plans for a workshop, to cost $12,000.

PLANTS, FACTORIES AND WAREHOUSES.

Hamilton, Ont.—The National Abrasive Company, Biggar avenue, are erecting a factory on Biggar avenue, to cost $15,000, and have awarded the steel work contract to the Hamilton Bridge Works Company, Limited. Architect G. J. Hutton, Bank of Hamilton Building, is preparing plans for an addition to the factory of the Steel Company of Canada, Harvey lane, to cost $100,000.

Mitchell, Ont.—A. Burritt Company, Mitchell, Ont., are erecting a factory, to cost $25,000, and have awarded the following contracts: Mason, John Avery, Fullarton road; carpenter, Wm. Eisermann, Toronto street; steel, A. Hill & Co., Main street.

Niagara Falls, Ont.—The Herbert Morris Crane and Hoist Company, Toronto, are erecting a factory on Stanley street, to cost $80,000, and their architects, Harkness & Oxley, Confederation Life Building, Toronto, have awarded the following contracts: Steel work, the Dominion Bridge Company, Montreal; general contract, Toms Construction Company, Kent Building, Toronto; sash operators, King Construction Company, 40 Dovercourt road; plumbing and heating, Keiths, Limited, Campbell avenue, Toronto; roofing, Reggin & Spence, 530 Front street, Toronto.

Petrolia, Ont.—The Colonial Knitting Company, Elmira, Ontario, will erect a factory at Petrolia, to cost $10,000. Mr. R. Kirkpatrick is their architect and general contractor.

Toronto, Ont.—The Newell Building Company, Limited, are erecting a warehouse on Duchess street, to cost $55,000, and have awarded the following contracts: General, John G. Kent and T. Essery, Confederation Life Building; plumbing and heating, A. Welch & Son, 304 Queen street west. The Cluff Ammunition Company, Limited, 111 Sterling road, are making repairs to their factory, at a cost of $10,000, and their architect, J. W. Siddall, Confederation Life Building, has awarded the general contract to M. Manley, 1058 College street.

Toronto, Ont.—The Williard Chocolate Company, Limited, Spadina avenue, are erecting a factory on Wellington street, to cost $80,000, and their architects and general contractors, S. L. Yolles and H. Rotenberg, 67 Baldwin street, have awarded the following contracts: Plumbing and heating, A. Welch & Sons, 304 Queen street west; elevators, Otis-Fensom Elevator Company, 50 Bay street; electric wiring, J. E. Myers, 4 Gould street. Davis & Mehr, Union Bank Building, are erecting a warehouse on Spadina and Grange avenues, to cost $100,000, and have awarded the general contract to J. G. Kent and Thos. Essery, Confederation Life Building.

Windsor, Ont.—The Maxwell Motor Company, Detroit, are erecting a factory on Tecumseh road and McDougal avenue, to cost $130,000, and have awarded the general contract to R. Westcott & Co., Chamber of Commerce Building.

PUBLIC BUILDINGS AND STATIONS.

London, Ont.—The Canadian Pacific Railway are rebuilding their station at London, Ont., at the cost of $15,000, and have awarded the general contract to G. Hayman & Sons, 432 Wellington street. Mr. M. Williams is the local superintendent.

Sudbury, Ont.—Plans for the new library building for the town of Sudbury, to be erected at the corner of Elm and Lorne streets, have not yet been prepared. The building will not be erected until next year.

Sarnia, Ont.—The Pere Marquette Railway have purchased a site on Clifford street for the erection of a station.

RESIDENCES, ETC.

Ford City, Ont.—C. J. Montreuil, Ford, Ont., is erecting a bungalow on Sandwich street, to cost $10,850, and his architects, G. Jacques & Co., Hydro Building, Windsor, have awarded the following contracts: General, E. Jacques, Assumption street, Windsor, Ont.; mason, George Sewell, 219 Ouellette avenue; carpenter, E. Jacques, 87 Assumption street; stone work, Maul & Rigg, McDougal street; plastering, John Reid, 158 Goyeau street; painting and glazing, J. Lauckner, 69 Sandwich street west; wiring, G. Campeaux, 121 Tuscarora street; heating, J. L'Heureux, 12 Wyandotte street east; plumbing and sheet metal, Windsor Hardware Company, Sandwich street.

Guelph, Ont.—Mrs. Jessie F. Auld, 123 Glasgow street, is erecting a residence on Glasgow street, to cost $7,500, and her architects, Wickson & Gregg, Kent Building, Toronto, have awarded the following contracts: Carpenter, George Scroggie, Woolwich street; electric wiring, W. W. Stuart, Quebec street; plumbing, F. Smith, Quebec street.

Hamilton, Ont.—Crafton & Co., James street north, are erecting a departmental store on James street north, to cost $100,000, and their architect, G. J. Hutton, Bank of Hamilton Building, has awarded the plumbing and heating contract to Adam Clark, 7 Main street. The Pattison Estate are erecting an apartment at the corner of King and Park streets, to cost $15,000, and their architects, Scott & Wardell, Sun Life Building, have awarded the following contracts: Mason, Hancock Bros., 35 Locomotive street; carpenter, Murray & Connor, 158 Victoria avenue south; sheet metal, Thomas Irwin & Son, 22 McNab street south; plastering, Hill Bros., 307 Emerald street north; painting and glazing, George Metcalfe, 16 Park street south; electric wiring, Culley & Breay, 35 King street west; plumbing and heating, Stanton & Mitchell, 159 York street.

London, Ont.—J. Cottam, care of Cottam Bird Seed Company, 87 Bathurst street, contemplates remodelling his store and apartments on Dundas street, at the cost of $8,000. R. H. Dowler, 176 Dundas street, is remodelling his store on Dundas street, at the cost of $10,000, and has awared the general contract to S. Willis, 765 Talbot street.

Ottawa, Ont.—Leon Petergorsky, 351 Chapel street, is erecting an apartment house on Elgin street, to cost $25,000, and has awarded the fire escape and stair contracts to M. Baylin, 96

Made in Canada

NORTHERN ELECTRIC COMPANY, CALGARY, ALBERTA.

The Roof for All First-class Structures—

THE roof is apt to be one of the very last things to be considered in the construction of a building. It really ought to be among the first. Owners wake up to this fact when they begin to pay bills for repairs and damage caused by leaks. Permanent buildings deserve permanent roofs. The most economical and altogether satisfactory permanent roof is a Barrett Specification Roof, with a unit cost (the cost per square foot per year of service) lower than that of any other permanent roofing.

It is for this reason that most of the great manufacturing plants and textile mills of the Dominion, the great railroad terminals and skyscrapers, and hundreds of less pretentious buildings carry roofs of this type. Some of these are from twenty to thirty years old and are still in serviceable condition.

A Barrett Specification Roof is not a ready-made roofing. It is built layer upon layer on the building, following time-tested methods which are recognized as standard by technical men generally.

A copy of The Barrett 20-Year Specification, with roofing diagrams, mailed free on request to any one interested.

Our 20-Year Guaranty Bond

We are now prepared to give a 20-Year Surety Bond Guaranty on every Barrett Specification Roof of fifty squares and over in all towns of 25,000 population and more, and *in smaller places where our Inspection Service is available.*

This Surety Bond will be issued by the United States Fidelity and Guaranty Company and will be furnished by us *without charge.*

Our only requirements are that the roofing contractor shall be approved by us, and that The Barrett Specification, dated May 1, 1916, shall be strictly followed.

If you wish any further information regarding this Guaranty, write to our nearest office and the matter will be given prompt attention.

THE PATERSON MANUFACTURING COMPANY, LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER

THE CARRITTE-PATERSON MANUFACTURING CO., LIMITED
ST. JOHN, N.B. HALIFAX, N.S. SYDNEY, N.S.

Nelson street. Lt.-Col. D. S. Street, 227 Somerset street, is erecting a residence on Range road, to cost $10,000, and his architect, W. F. Noffke, 45 Rideau street, has awarded the following contracts: Mason, Lindle & Co., Ottawa; carpenter, F. A. Grieck & Co., Ottawa; plastering, Murphy & Morrow, Billing avenue; painting and glazing, Duford, Limited, 70 Rideau street; wiring, D. Ackroyd, 416 Bank street; marble and tile, A. K. Mills & Son, 191 Sparks street; plumbing and heating, J. T. Blyth, Frank street. Dr. J. F. Argus, 189 O'Connor street, is making an addition and alterations to his apartment house, at the cost of $6,200, and his architects, Taylor & Horwood, Castle Building, have awarded the following contracts: Painting and glazing, G. Higman & Son, 176 Rideau street; electric wiring, P. Ackroyd, 416 Bank street; heating and plumbing, J. T. Blyth, Frank street.

Renfrew, Ont.—Thomas A. Low, Renfrew, is erecting an addition to his residence at the corner of Stewart and Brush streets, at the cost of $10,000, and his architect, W. E. Noffke, Central Chambers, Ottawa, has awarded the tile roofing contract to McFarlane-Douglas Company, 250 Slater street, Ottawa.

St. Catharines, Ont.—A. E. Jenckes, 139 Ontario street, is erecting a residence on Ontario street, to cost $5,000, and his architect, T. H. Wiley, 128 St. Paul street, has awarded the following contracts: Mason, Newman Bros., 75 St. Paul street; carpenter, Nunnemacher & Parke, 5 Dufferin street; heating, John Peart, St. Catharines.

Toronto, Ont.—M. Healy, 153 St. George street, is erecting a residence on Rose Park Drive, to cost $5,000. Jas. Thompson, 31 Farnham avenue, is his architect. Plans have been prepared for a residence for M. Reid, 2341 Queen street east, to be erected on Crown Park road, to cost $4,200. Grimshaw Bros., 24 Brookmount road, contemplate the erection of ten pairs of residences to be erected at the corner of Lockwood and Dixon avenues, to cost $60,000.

Toronto, Ont.—A. D. Langmuir, 2 North street, is erecting a residence on North street, to cost $8,000, and his architects, Denison & Stephenson, 18 King street west, have awarded the following contracts: Mason, G. T. Cayton, 56 Lyall avenue; carpenter, J. C. Scott Company, 106 River street; painting, A. E. Phillips, 49 Richmond street east; plastering, A. Petrie, 457 Roxton road; tile, Canada Glass, Mantel and Tile, Limited, 328 Carlaw avenue; sheet metal and roofing, A. Mathews, Limited, 256 Adelaide street west; plumbing and heating, A. Wright, 3 Gerrard street east. W. P. Levack, 159 Roxton road, is excavating for his residence on High Park avenue, to cost $5,000, and has awarded the plumbing contract to Wm. Howard, 74 Borden street. Plans have been prepared for a residence for Wm. Scott, 125 Mutual street, to be built on Victor avenue, at the cost of $5,000. The excavation has been commenced on stores and apartments for E. D. Morris, 2167 Queen street east, on Queen and Wineva avenue, to cost $25,000. Architect W. G. Hunt, Confederation Life Building, has prepared plans for a residence for Mr. Crawford, Toronto, to cost $6,000. C. F. Wagner, Toronto, is erecting a pair of residences on Bellefair avenue, to cost $5,000, and has awarded the following contracts: General, J. T. Moore, 34 Brookmount road; plumbing, Fiddes & Hogarth, 122 King street east. G. H. McLaughlin, 48 Hogarth avenue, has excavated for a pair of residences on Millbrook crescent, to cost $8,000. Wm. Vokes, 228 Rusholme road, is excavating for a duplex residence on Rusholme road, to cost $6,000. L. Gelber, 133 Lowther avenue, is erecting a residence on Lowther avenue, and his architect, J. A. Thatcher, 37 Cowan avenue, has awarded the following contracts: Mason, J. McMurren, 19 Roxborough road; carpenter, C. Gallichan, 62 Dovercourt road; painting, Bavington Bros., 48 Glenlake avenue; heating, W. Schulkins, 932 College street. W. H. Cawthra, 60 Forest Hill road, is making an addition and alteration to his residence, at the cost of $11,000, and his architects, Eden Smith & Sons, 33 Scott street, has awarded the following contracts: Mason, T. & A. G. Ham, 83 Salem avenue; carpenter, Robinson & Wilson, 34 Alcina avenue; plastering, W. H. Little, 62 Tranby avenue; roofing, G. M. Byron, 503 Yonge street; painting, F. G. Roberts & Co., 106 Wells street; wiring, R. A. L. Gray & Co., 85 York street; plumbing, Fiddes & Hogarth, 122 King street east; heating, Jos. Morrison, 8 St. Mary street; hardware, Canada Hardware Company, Limited, 39 Richmond street east.

Windsor, Ont.—Charles Jessop, 75 London street west, is erecting a residence on Caron street, to cost $5,000.

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SCHOOLS, ETC.

Apple Hill, Ont.—Architects Millson & Burgess, Union Bank Building, Ottawa, Ont., are preparing plans for a church to cost $20,000, and have awarded the general contract to Alex. Cameron, Alexandria, Ont.

Brantford, Ont.—The Polish Roman Catholic Church contemplates the erection of a church on Terrace Hill.

East Toronto.—The trustees of Separate School Board No. 7 are erecting an addition to a school at the cost of $22,000, and their architects, S. B. Coon & Son, Excelsior Life Building, have awarded the following contracts: Mason, steel work, concrete and composite floors, R. Chalkley & Son, 34 Victoria street; carpenter work, plastering, painting, wiring and roofing, Hudson & Mosley, 5 Jerone street; heating, Sheppard & Abbot, 78 Harbord street.

Hamilton, Ont.—St. Luke's Church are erecting a parish hall at the corner of John and MacAuley streets, to cost $12,000, and their architect, W. G. Brown, Clyde Block, has awarded the following contracts: Sheet metal, H. Trewolla, 729 Cannon street east; painting and glazing, E. Scoffin, 520 St. John street north; heating, Burrow, Stewart & Milne Company, Cannon street east. The Township of Barton are making an addition to a school at the cost of $25,000, and their architect, J. A. Armes, 183 Bold street, has awarded the general contract to Isbister Bros., 811 King street east.

Kingston, Ont.—The Regiopolis College contemplates the erecting of a boarding school, to cost $50,000.

London, Ont.—The Provincial Secretary's Department, Parliament Buildings, Toronto, are making repairs to the Asylum for the Insane at London, and have awarded the general contract to Jones Bros., Hamilton road, and the slate roof contract to Charles Riddle, 119 Wellington street, St. Thomas, Ont. Architect W. G. Murray, Dominion Savings Building, is preparing plans for a school for the school trustees of Westminster Township, to cost $10,000.

London, Ont.—Architects Watt & Blackwell, Bank of Toronto Building, are preparing plans for a women's pavilion at the Byron Sanitorium, to cost $10,000, for the London Health Association, London, Ontario, and have awarded the general contract to R. G. Wilson & Son, 193 College street, and the carpenter contract to J. Moran, 921 Maitland street. The Military Hospital Commission, Ottawa, are preparing plans for a school to be erected at the Byron Sanitorium, to cost $10,000.

New Toronto.—The Public School Board of New Toronto contemplates the erection of new schools.

Perth, Ont.—The Public School Board of Perth, Ont., are making improvements to a school at the cost of $30,000, and their architects, Ellis & Ellis, Manning Chambers, Toronto, Ontario, have awarded the plumbing and heating contracts to W. G. Butler, Gore street, Perth, instead of to J. T. Blyth, Frank street, Ottawa, as previously reported.

Simcoe, Ont.—The Western Suburban School Section contemplates the erection of a new school on Glazebrooke property.

St. Ferdinand, Que.—The Les Soeurs de la Charite, St. Ferdinand, Que., will erect a convent, to cost $80,000, and their architect, J. S. Bergeron, 103 St. Jean street, Quebec, has awarded the following contracts: Mason, Charles N. Paradis, Quebec; carpenter, Poudrier & Boulet, Black Lake; heating and plumbing, O. Picard & Fils, Quebec; sheet metal, Eugene Falardeau, Quebec.

Thornhill, Ont.—The Public School Board of Thornhill con-

GLIMPSE OF GARDEN AT GOVERNMENT HOUSE, TORONTO.

templates the erection of a school, to cost $20,000, and have commissioned James, Louden & Hertzberg, architects, Excelsior Life Building, Toronto, to prepare plans.

Toronto, Ont.—The Women's College and Dispensary, 125 Rusholme road, are erecting an addition to their hospital, and their architects, Gordon & Helliwell, Confederation Life Building, have awarded the following contracts: Mason, Thompson Bros., Ryrie Building; carpenter, D. McMurren, 66½ Hayden street; heating and plumbing, Sheppard & Abbot, 78 Harbord street; plastering, Hanna & Nelson, 273 Rusholme road; fire escapes, Canada Ornamental Iron Works, 88 River street; terrazzo, Italian Mosaic and Tile Co., 429 Spadina avenue. Architects Burke, Horwood & White, Ryrie Building, are preparing plans for a church and Sunday school for the Weston Road Baptist Church, to cost $20,000, to be built on the corner of Silverthorne and Rowantree avenues.

CATALOGUES and BOOKLETS

Booklet on Tin Plate.—The American Steel Export Company has recently published a sixteen-page illustrated booklet thoroughly describing in a most concise way the practice of American makers of tin plate. The chief object of the booklet is the elimination of the confusion existing in the export trade, because of the difference in the methods employed in the various countries where this commodity is manufactured. It deals first with a brief history, then the process of manufacturing. Numerous pages are devoted to the proper placing of orders, the exact method of figuring prices and the usual method of packing for export. So far as can be learned this is the first time that any information of this character has been issued, and the booklet should meet with considerable approval.

War-time Economy in Steel Equipment.—Steel lockers and factory equipment is usually considered for purchase chiefly on the grounds of its being modern, fireproof, indestructible, sanitary and of good appearance.

In these days of war saving, however, the economical side comes more prominently to the fore. Steel lockers effect a positive and noticeable economy wherever installed. They save in ultimate cost, because they are unbreakable, consequently do not have to be either repaired or renewed. They save in floor space—a valuable consideration. They save in time otherwise lost by employees looking for a safe and suitable place to bestow clothing, tools, etc. They stop petty thefts and prevent trouble with and among the help.

The chief aim in the ever-growing "welfare movement" in this country is to so provide for the health, comfort and convenience of work people that they will be more attached to the firm employing them, more contented in their positions; therefore easier to handle and less liable to change.

The firm or individual providing the best accommodation for help will most assuredly obtain the choicest class of employees—a further decided benefit, and a factor well worth considering, in view of the general scarcity of help.

Every employer who is anxious to conduct his plant, store or institution on lines of war-time economy would be well advised to write The Dennis Wire and Iron Works Co., Limited, London, for their illustrated catalogue.

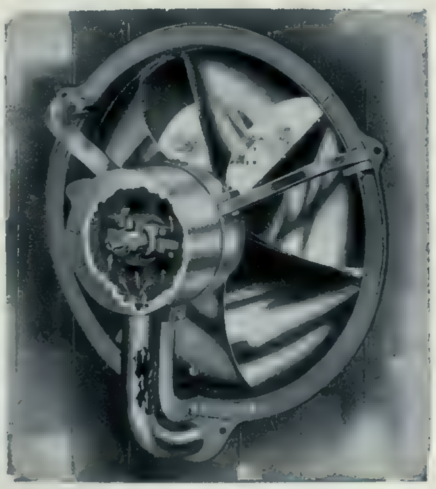
◆

THE PROBLEM OF CONSERVATION IN OFFICE PRACTICE.

While efficiency, which may be termed conservation gone mad, has become epidemic, and has led to "following copy out of the window," as printers would term it, in a considerable part of the business world, the golden mean, conservation, still stands for prudence, order and consequent success in the conduct of business affairs. Nowhere is this element of system so necessary, and so little observed, as in the offices of the average architect. Those offices in which volume of business has in a measure supplanted artistry and study of design and effect, have of necessity adopted systems of procedure, but by many even the need of definite office hours and the employment of a stenographer is not realized. Not alone temperament, but many other circumstances are responsible for this lack of order in the conduct of the business end of the profession. The pure gambling nature of his work is largely the starting point from which other irregularities grow. December and January has found the office bare of work and little prospect in sight. A consequent dropping of the hardly acquired and organized office force follows. March brings many "prospects" and a search for draftsmen. May too often finds these prospects "put over till next year," and others hanging, until the question of reduction again becomes a serious problem. This leads to a general disorganization that affects every department of the office procedure. There are, however, a few conserving rules and methods by which the meeting of both ends through the elimination of waste may be effected in most offices. First, a card index for recording jobs and their office cost and other definite details is a business requirement that too few architects realize. Second may be placed the absolute rule that no sketches, no advice, be given a prospective client until a contract has been signed by him and a fee charged for such preliminary work. Third may be placed the absolute rule to avoid competitions except when paid for without regard to the success in their adoption. The following of these rules will eliminate the accumulation of an unnecessary and largely unremunerative office force, and also give time to look up work that will keep the regular organization employed in the slack periods of the year. This procedure makes for steadiness in the office work, and, while it reduces the volume of its output, it conserves its executive strength. It eliminates as far as possible the element of fluctuation, which is fundamentally the losing factor in achitectural practice.—The Western Architect.

◆

John Watson & Son, Limited, Montreal, have been awarded the following contracts for metal and architectural iron works: New Toronto Terminal Station, Toronto, Ont.; Canadian Northern Railway Station, Montreal, Que.; American Canadian Factory, Montreal, Que.; Power House, Lennoxville, Que.; Aird's Bakery, Montreal, Que.; Consumers' Cordage Co., Montreal, Que.; ten-storey building, Greater Montreal Land and Investment Company.



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CONSTRUCTION

September, 1917 Vol. 10, No. 9

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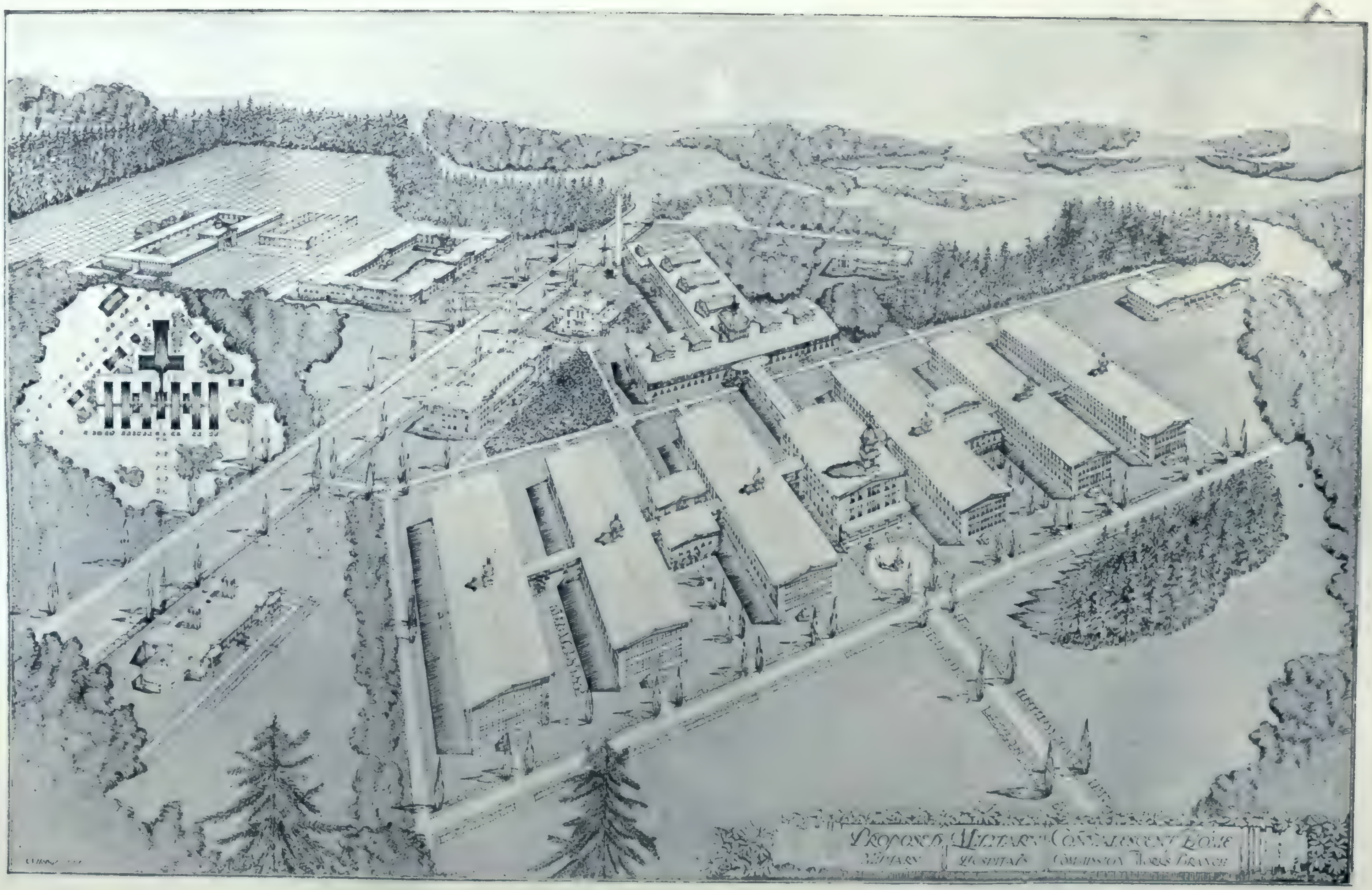
Full Page Illustrations

PROPOSED MILITARY CONVALESCENT HOME (Frontispiece) 292

H. GAGNIER, Limited, Publishers
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK


Proposed Military Convalescent Home
Military Hospitals Commission Works Branch

PLOPOSED SIX HUNDRED BED MILITARY CONVALESCENT HOSPITAL AND VOCATIONAL BUILDINGS, THE SITE OF WHICH HAS NOT YET BEEN ANNOUNCED BY THE MILITARY HOSPITALS COMMISSION OF CANADA.

Canada's Military Convalescent Hospitals

Accommodation for Wounded and Disabled Soldiers Increased Nearly Four Times Since January—New Type of Hospital Buildings of Temporary Permanent Construction Taking the Place of Reconstructed Old Buildings

ON the first of January, this year, 2,400 returned wounded soldiers were being cared for by the Military Hospitals Commission in its chain of institutions across Canada. On August first the number had increased to over 8,500.

Last January it was just as difficult to accommodate that 2,400 men as it is to-day to find beds for the 8,500. If anything the Commission is better abreast of the situation now than then. There is not in the length and breadth of Canada an out-patient who would be better off in a ward, and there have been few occasions in the past when this could be said.

It is on the Works Branch of the Commission that the burden of meeting this extraordinary expansion has fallen. Before there was any Military Hospitals Commission, Capt. W. L. Symons of the Canadian Engineers (formerly of Symons & Rea, architects, Toronto) was assigned to make the necessary structural alterations in buildings intended for use as military hospitals. From using sapper labor and fatigue parties in erecting temporary rough board partitions in buildings often little better than woodsheds, and pleading for the price of a blind to hang on a nurse's window, Capt. Symons has seen his Department grow in two short years to one spending hundreds of thousands of dollars. In a recent term of two months the accounts requiring his approval increased ten-fold.

In spite of the terrifying problem of expansion set before the Commission's officials, sit back and think for a moment and it will be realized that the errors of commission and omission which have received public criticism, have been surprisingly few in number and trivial in character. With so supremely imperative an undertaking as the war on its hands, the Government has been forced to treat all other problems, even at times the care of the returning wounded, as secondary in importance. Recognizing this as just and necessary, the Commission has faced its handicap, and instead of struggling a long way in arrears, has stood on its own feet and steadily pushed its way ahead. To-day it has evolved an organization believed to be capable of meeting almost any emergency with which it is likely to be faced. Tremendous as has been the mere building problem, other branches of the organization have not suffered. They have expanded, developed and improved more than commensurately. The department chiefs have seized upon numerous up-to-date scientific methods for the rehabilitation of the wounded, and sub-departments are constantly being formed to undertake new systems of repairing the human debris of the battle field.

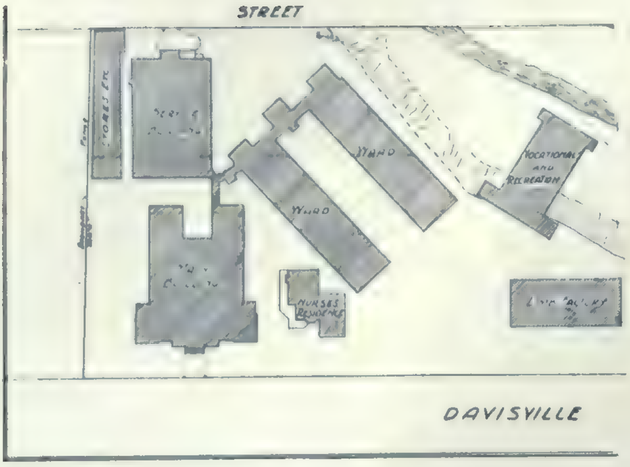
Every new method of dealing with the returned soldier question has imposed another problem upon the works branch. The mere provision of beds has been no small task in itself, but with the many technical requirements of the numerous sciences practised in the Commission's institutions, complex phases calculated to baffle the most astute architect have been added. Nevertheless, medical men have commented upon the remarkably convenient facilities afforded them.

From a building man's standpoint the notable fact about the Commission has been its creation of a new type of building—the military convalescent hospital. In this term all three words express distinct features of the institution which have been considered in designing the structure. To grasp the significance of the supreme type evolved one must trace the history of the Commission from early days.

FROM THIRTY TO NINE HUNDRED BEDS.

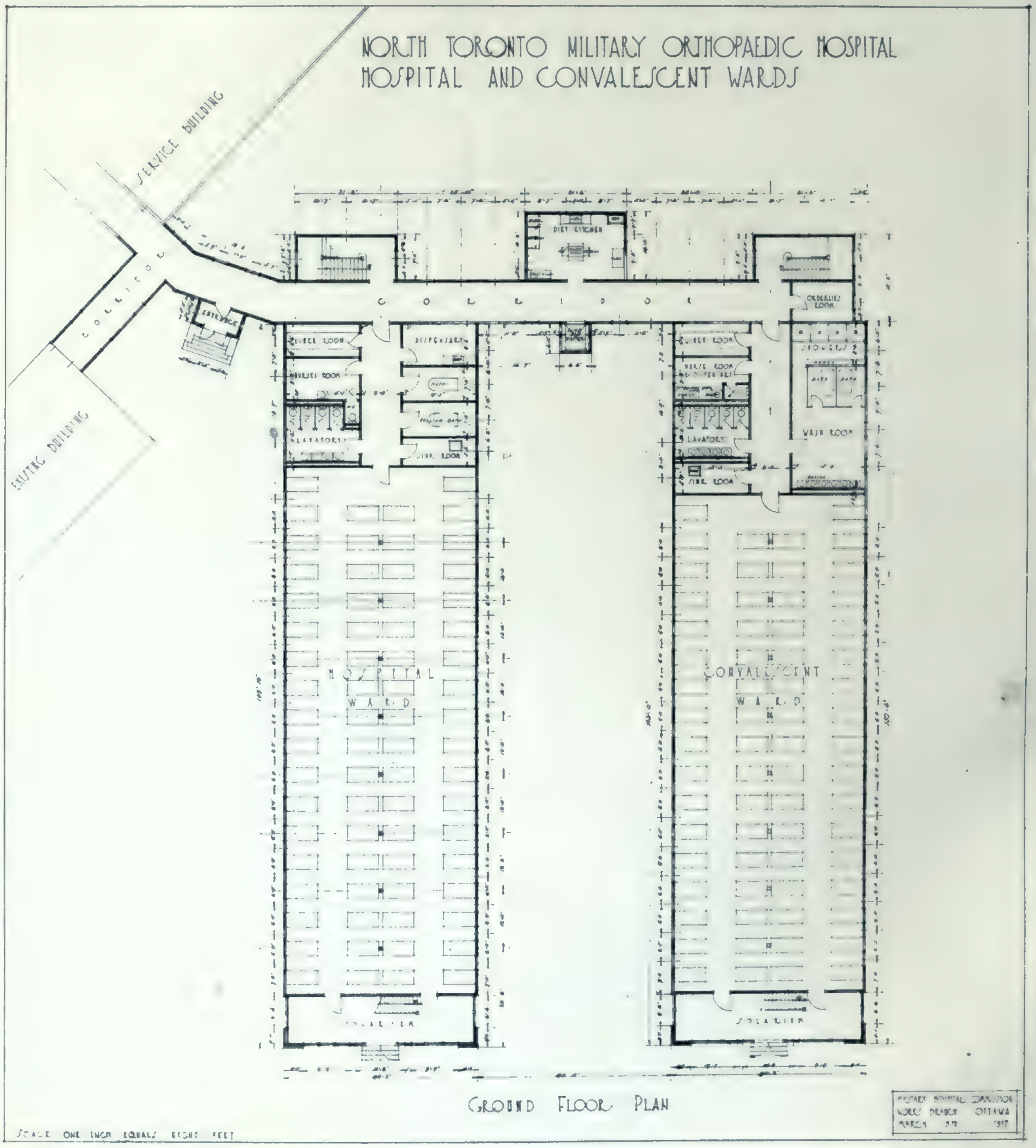
The first convalescent homes were private residences generously loaned by their owners. Among the first were the Clayton residence in Halifax, the Ross home at Sydney, the Merritt home of St. Catharines, the Parks dwelling at St. John, the William Dobell place at Quebec, and others in cities throughout Ontario and the West. These dwellings, designed as living quarters for seven or eight people at the most, were made to accommodate from twenty to thirty-five soldier patients. The Sir Sandford Fleming home at Ottawa indicates what can be done. There are over seventy soldiers living in this place intended for the use of one family.

Few structural alterations were necessary to accomplish these results, excepting increases in the kitchen and dining room accommodation and additional bathrooms and plumbing to provide for thirty instead of eight or ten people. The great advantage of these small residences over other buildings offered in the early days was that they were usually surrounded by grounds. The unsuitability of existing general hospitals was that the soldiers were convalescents—up-patients—and had to be able to go out. It was found, however, in a short time that the cost of putting these small buildings in shape was out of proportion to the results obtained. In addition to the enlarged kitchen and plumbing



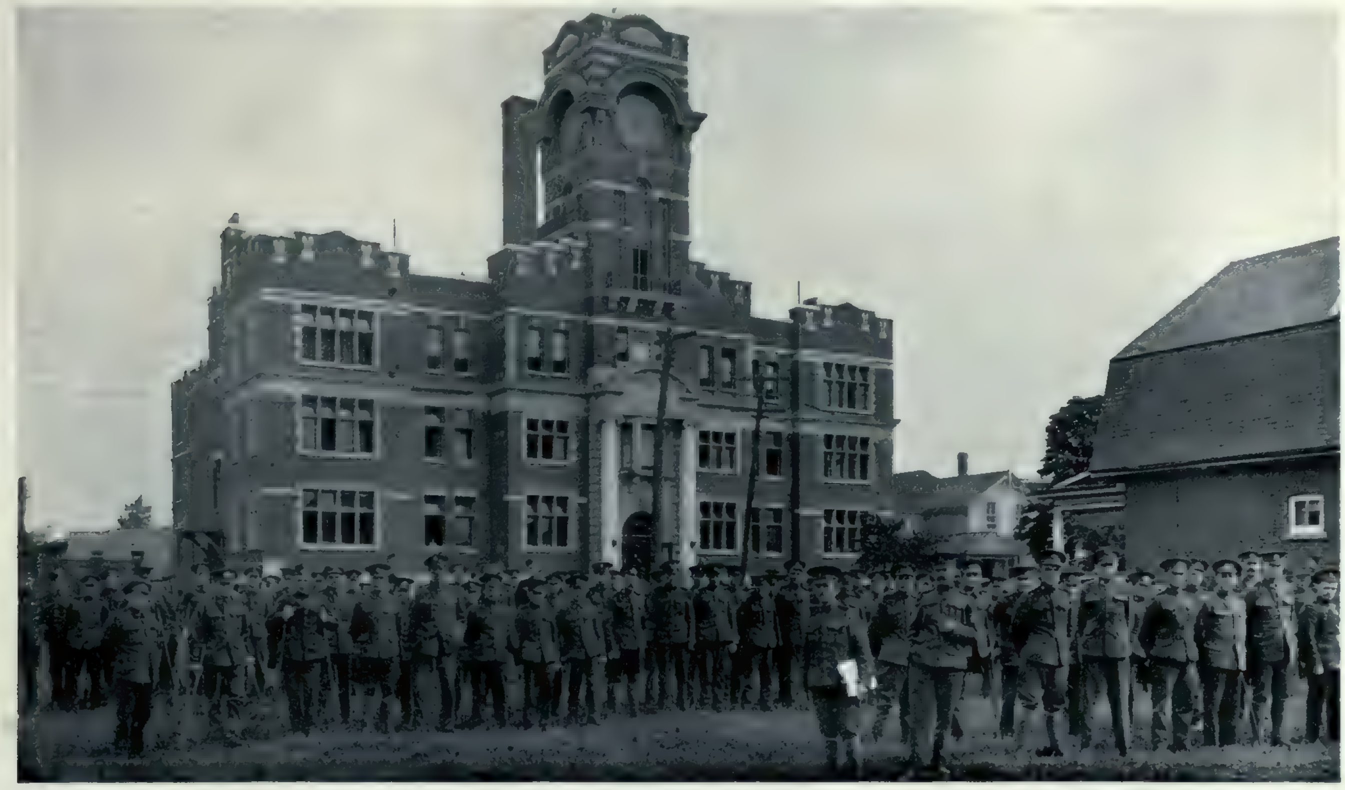
BLOCK PLAN, NORTH TORONTO ORTHOPEDIC HOSPITAL.

BILLIARD ROOM AT NORTH TORONTO HOSPITAL.

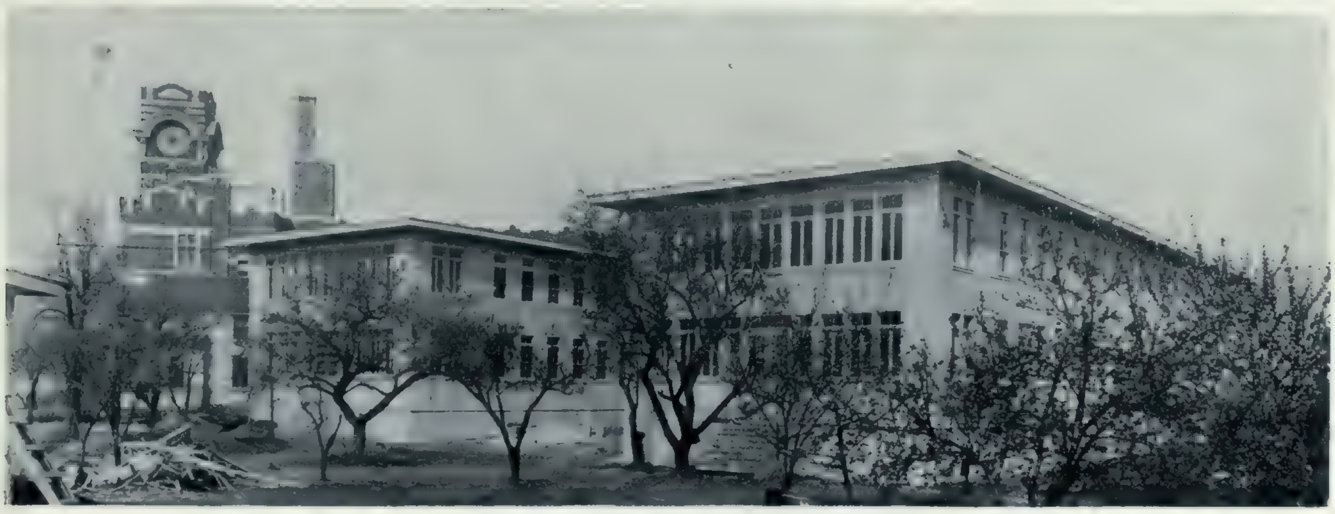


facilities the Commission often wound up by erecting a separate storage building, and usually the out-buildings had to be remodelled as residences for male help on the hospital staff.

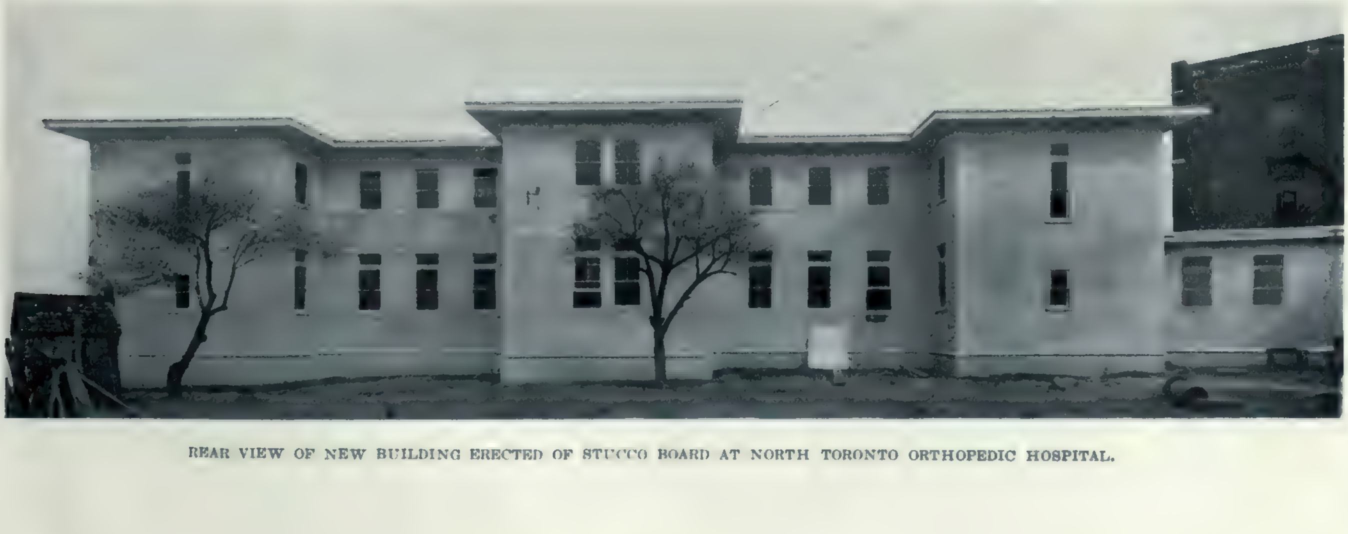
Need for accommodation rapidly outgrew these small buildings. The number of men re-



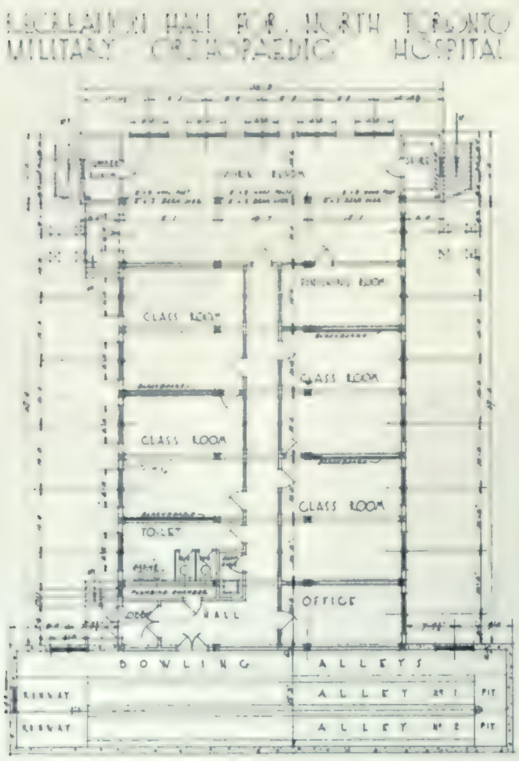
MORNING PARADE AT MILITARY ORTHOPEDIC HOSPITAL, NORTH TORONTO, ERECTED BY THE SALVATION ARMY AS BOOTH MEMORIAL HOME.



TWO WARD WINGS OF MILITARY ORTHOPEDIC HOSPITAL CONNECTED WITH BOOTH MEMORIAL BUILDING.

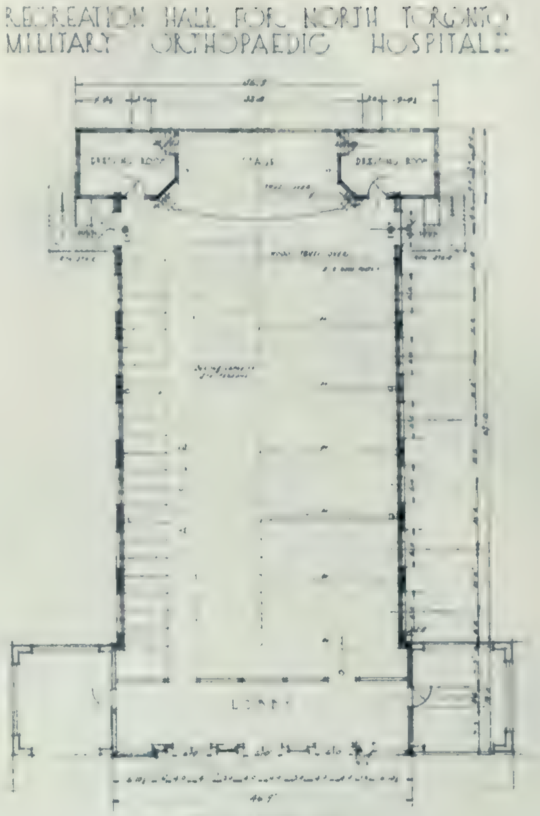


REAR VIEW OF NEW BUILDING ERECTED OF STUCCO BOARD AT NORTH TORONTO ORTHOPEDIC HOSPITAL.



GROUND FLOOR PLAN

SCALE – ONE INCH EQUALS EIGHT FEET   M H C WORKS BRANCH OTTAWA JUNE 1917

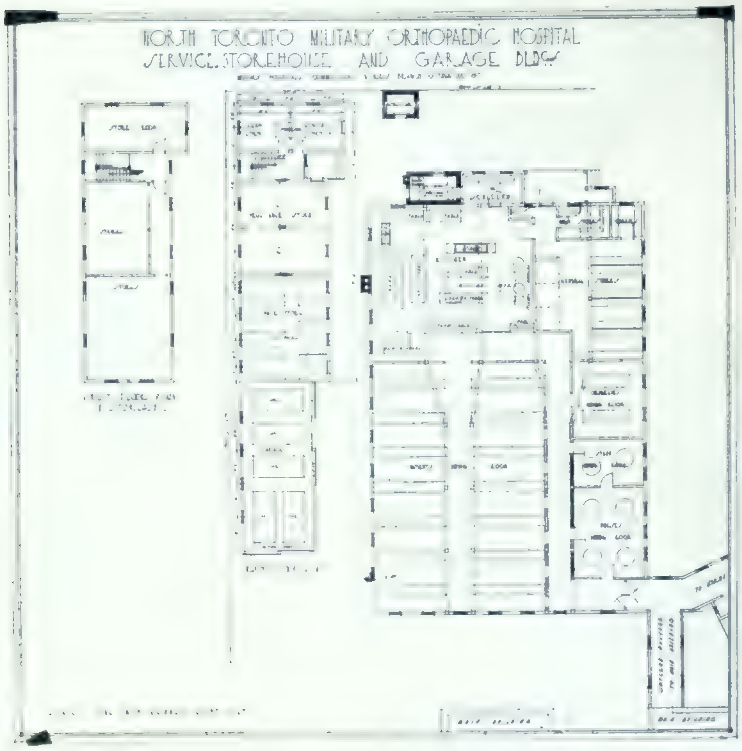

RECREATION HALL FOR NORTH TORONTO
MILITARY ORTHOPAEDIC HOSPITAL
LOBBY

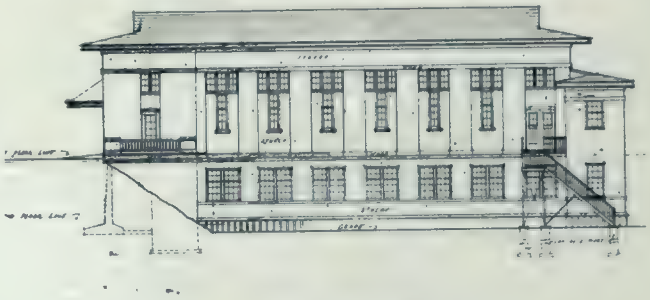
FIRST FLOOR PLAN

SCALE – ONE INCH EQUALS EIGHT FEET   M H C WORKS BRANCH OTTAWA JUNE 1917

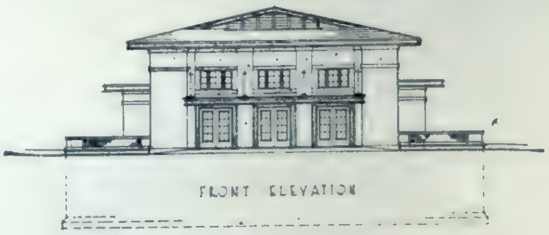
turning was so great that it became uneconomical to establish separate staffs and equipment for institutions so small as these, when the patients could be grouped in larger hospitals requiring no greater, or little greater, staff.

Larger buildings were accordingly taken over. Among the first were the Grey Nunnery, Montreal; Deer Lodge, Winnipeg; Knox College and Bishop Strachan School, Toronto, and the Immigration Hospital, Savard Park, Quebec. The last three named are now known as Spadina, Central and Savard Park Military Convalescent Hospitals. Another fine college building taken over recently was Loyola College, Drummond street, Montreal, and there have been many others. Colleges possess a rather peculiar suitability for the needs. They usually have large kitchens

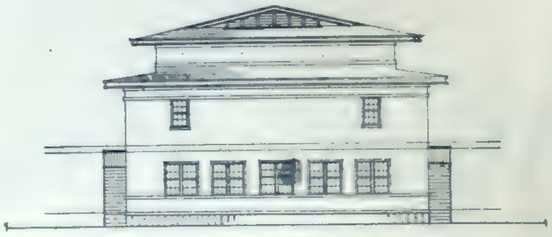

NORTH TORONTO MILITARY ORTHOPAEDIC HOSPITAL
SERVICE, STOREHOUSE AND GARAGE BLDG



SIDE ELEVATION



FRONT ELEVATION



REAR ELEVATION

SCALE ONE INCH EQUALS EIGHT FEET   MILITARY HOSPITALS COMMISSION WORKS BRANCH OTTAWA JUNE 1917 and dining rooms, class rooms suitable for dormitories and, in some cases, open dormitories capable of holding twenty or thirty beds each. Hotels have been offered to the Commission on some occasions, but a very good hotel is entirely unsuitable, the cost of removing its substantial partitions being too great.

THE NEED DEFINED.

The Commission's need is for buildings with large open ward spaces, and there should be grounds if at all possible. The institutions must be convenient to large centres for several reasons—convenience in obtaining all kinds of supplies, and accessibility to first-class medical practitioners. On the other hand, experience has shown that the patients are better off outside of the city where the air is better. Some buildings have had to be rejected because special apparatus and equipment could not be conveniently installed in them. Before any building could be accepted, it was neccessary for a representative of the Works Branch to make a survey of the premises with a view to ascertaining the possibilities of adaptation to the Commission's needs. Public opinion being less well-informed as to the requirements has sometimes disagreed with rejections made by the Commission's officers, but it is safe to say that the selection in most cases has been wise under the then existing conditions.

Adapting a building the size of Knox College or Loyola College to another use than that for which it was designed naturally proved a large and an expensive undertaking. Recognizing that while proper economy should always be observed in the public service, the Commission decided from almost the outset that its institutions must be absolutely suitable for the administration of the treatment desired.

"We aim at results," is the way Captain Symons puts it. "We are not doing this thing for a joke, going about it in the easiest way. We are following the very best laid down world-wide rules for hospital erection. We are studying our plans with a view to producing the very best results."

STAND-TO IN ONE OF THE SEVENTY-FIVE BED WARDS IN THE ORTHOPEDIC HOSPITAL.

KITCHEN AT NORTH TORONTO, SHOWING ENTRY TO DINING POOM ON LEFT.

WELL-LIGHTED DINING ROOM AT NORTH TORONTO HOSPITAL.

COST OF REMODELLING TOO GREAT.

Each of these college buildings had a possible accommodation of about two hundred men, but the cost of renovation was equal to if not more than that of erecting a two hundred bed hospital of the type which the Commission has since then evolved. Take Loyola College, for instance. The Commission spent about $75,000 on renovation, although the building already had assembly halls, dormitories, class rooms and dining halls, and was about as suitable as any building ever taken over. Even with all this, the conversion of the class rooms into dormitories meant an increase of plumbing, etc., and in substantial buildings one cannot make alterations without heavy expense. It means well done work being re-done. A feature not often regarded by the public is that the agreements in regard to most of these buildings oblige the Commission to return the buildings as they were found, thus doubling the cost.

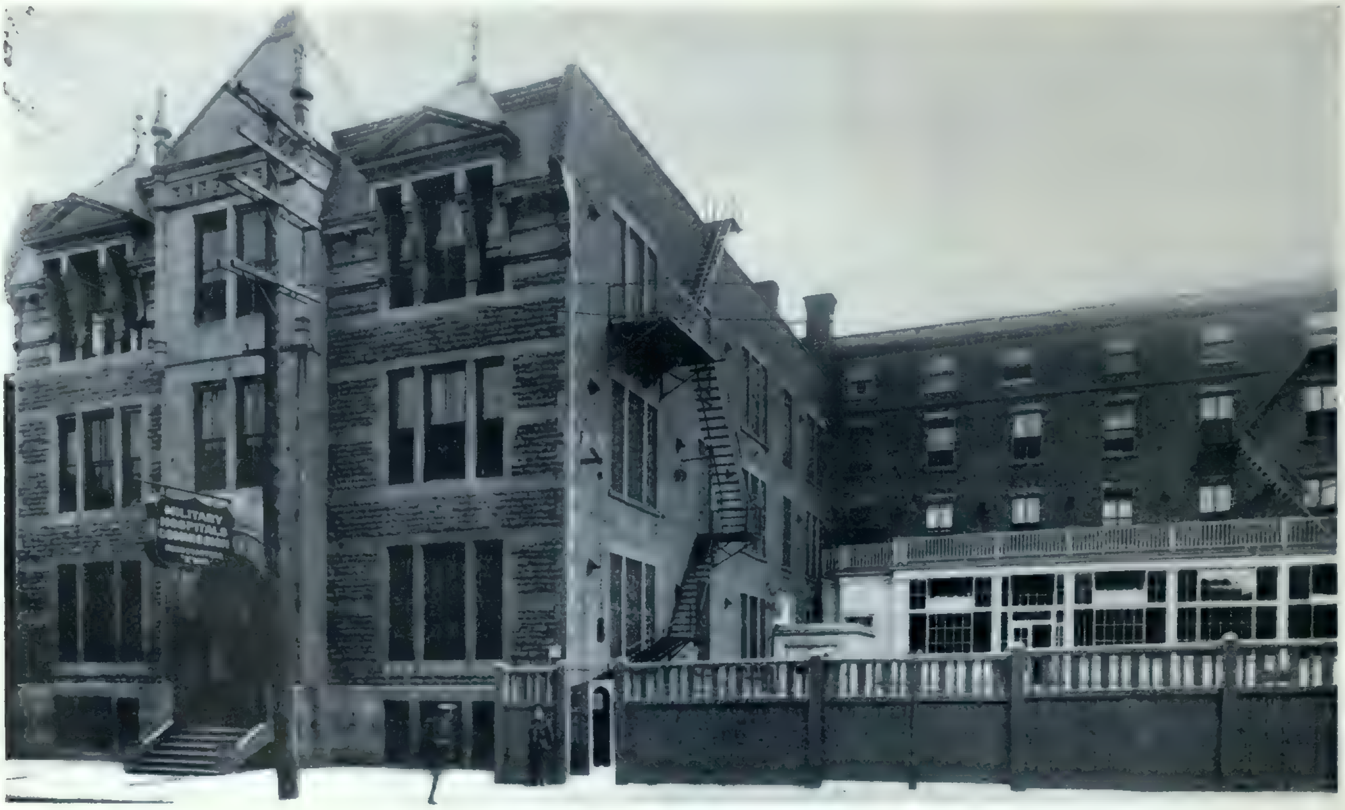
TYPICAL WASH ROOM AT NORTH TORONTO.

An illustration is shown on another page of a large dormitory in the Drummond Home. This space was formerly occupied by fourteen separate rooms and connecting corridor. The Commission took all the interior partitions down and made a room a hundred feet long. A great deal of support was thus removed from the upper story and care had to be taken to protect the strains. The floors were strengthened with additional steel beams and columns, and every precaution was taken to make the building safe. Similar alterations had to be made in a number of places thus converted, although no two buildings presented the same problem.

DISTINCTIVE FEATURES AT N. TORONTO.

The next development was a decision to use certain existing buildings for what they were worth without very great alteration, and to add specially constructed wards as temporary wings. At the Orthopedic Hospital, North Toronto, where a half completed training school of the Salvation Army was taken over, is a splendid example of this class of work. In fact, in this institution are found almost all the distinctive features of the Commission's construction. A careful study of what was done here will tell more of the present story than could be hung around any other place.

The Booth Memorial Home was the name given the institution by the Salvation Army. It



DRUMMOND MILITARY CONVALESCENT HOSPITAL, MONTREAL, FORMERLY LOYOLA COLLEGE. THE SOLARIUM WAS ADDED BY THE M. H. C.

was a substantial brick building, fortunately having several acres of vacant land adjoining. A survey disclosed that by making a very few alterations in the plans the structure could be completed to provide accommodation for about one hundred and fifty hospital beds. It was decided that additions should be erected on the adjacent land, but a very serious problem in orientation arose. The main building faced south, yet the only place where a wing could successfully be attached was at the rear. It has been the architect's constant aim to arrange his plans to give proper sunlight in the wards. At North Toronto the purpose was achieved by erecting a large service building containing kitchen and dining room for four hundred men directly behind the original building. By running a connecting corridor north-west, it was made possible to put up two long ward wings facing south-east, an angle considerably at variance from the main building and not commended for its beauty. Orientation was the object aimed at, however, not beauty. Three hundred beds are located in these two wings in four wards of seventy-five beds each, the wings having two stories.

These new wards are for convalescents. The main building is kept largely for infirmary and administration purposes. Portions of it have been adapted for operating suites, hydrotherapeutic equipment, massage and dental service. The entire administration of the hospital is in the main building, suitable rooms having been allocated to the medical officers, officer commanding, matron, dietitian and clerical staff.

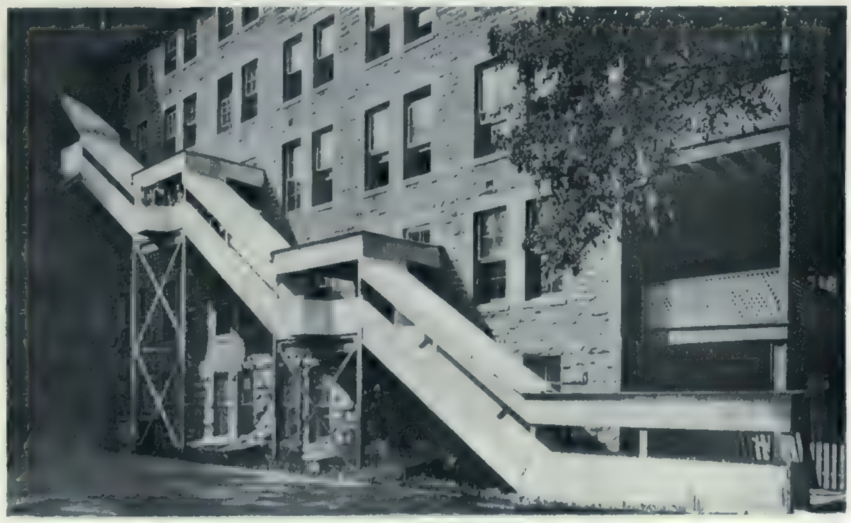
SPECIAL EQUIPMENT ROOMS.

The operating suite was selected because of its splendid corner light. A wooden floor was taken up and granolithic substituted. A cement wainscotting four or five feet deep was installed. To put in the necessary plumbing, control basins, etc., fundamental work had to be begun in the base-

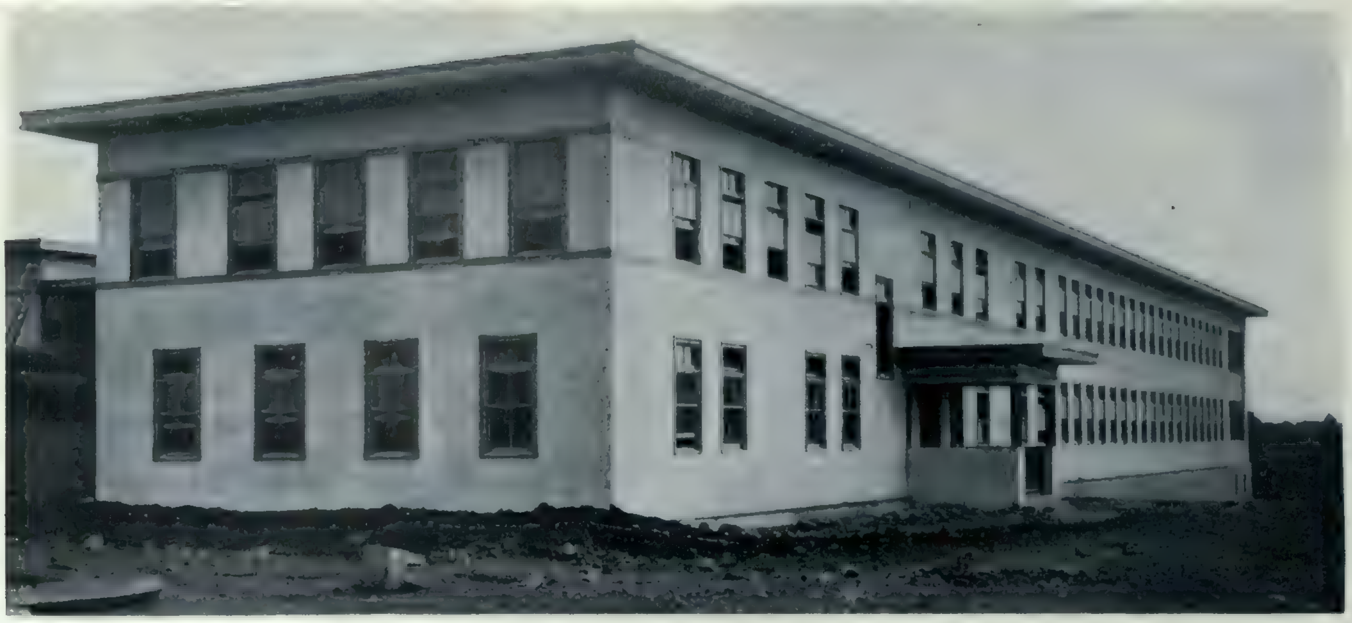
CAFETERIA AT DRUMMOND CONVALESCENT HOSPITAL, MONTREAL.

TYPICAL WARD AT DRUMMOND CONVALESCENT HOSPITAL.

BILLIARD AND RECREATION ROOM AT DRUMMOND HOSPITAL.



FIRE ESCAPE CHUTE AT GREY NUNS' MILITARY CONVALESCENT HOSPITAL, MONTREAL.

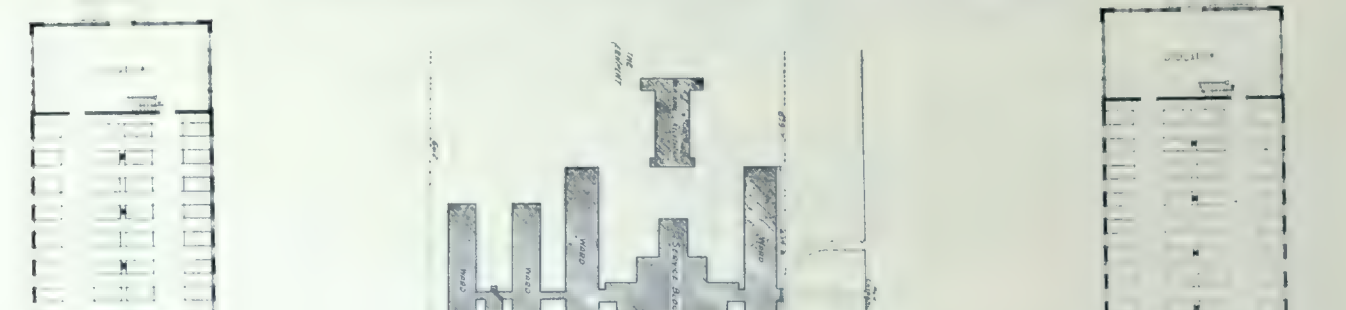


FIRST WING OF MILITARY CONVALESCENT HOSPITAL AT CAMP HILL, HALIFAX, NEARING COMPLETION.

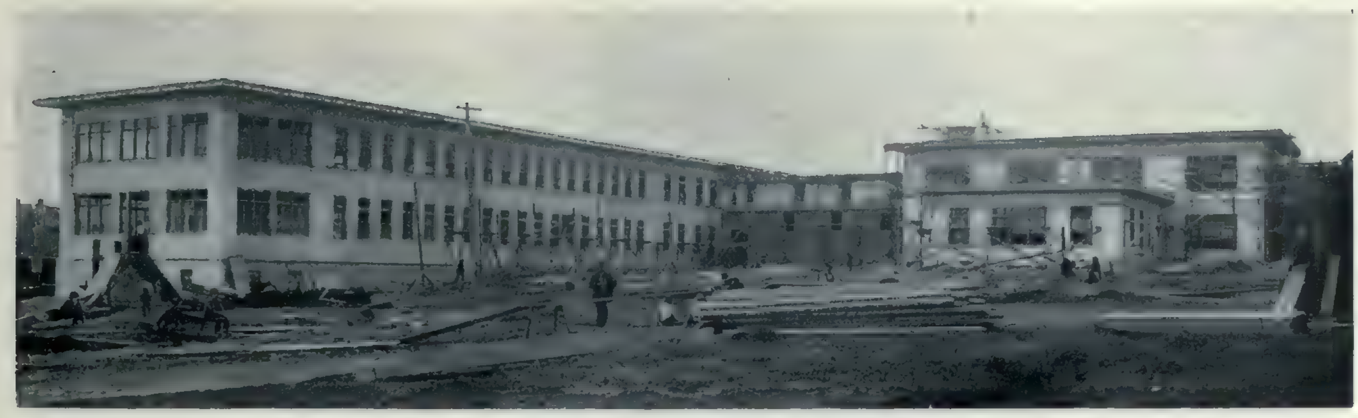
ment and proper piping laid. A sterilizing room, anaesthetic room, doctors' room, and other features had all to be arranged for en suite.

Indicative of the class of equipment used by the M.H.C. is the Frink operating light supplied. This arrangement is considered to be the very last word in lighting for surgical work. The fixture consists of a group of powerful lamps so placed that there can be no shadow no matter how the surgeon goes to work.

In the hydrotherapeutic

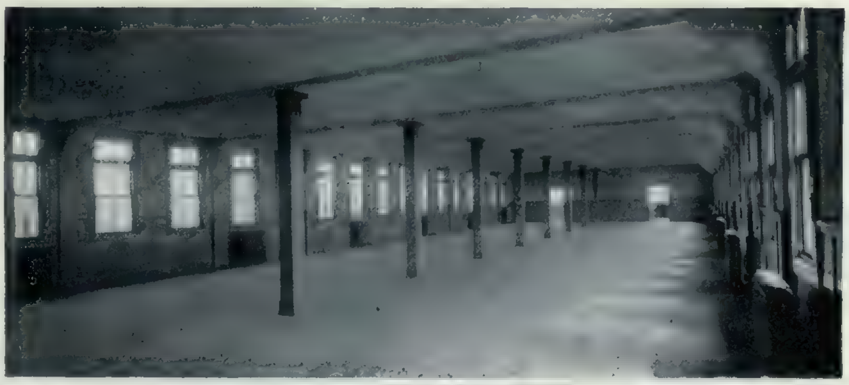


PLAN OF CAMP HILL MILITARY CONVALESCENT HOSPITAL WITH BLOCK PLAN INSET, SHOWING HOW TWO ADDITIONAL WINGS WILL BE ADDED TO MAKE IT A SIX HUNDRED BED INSTITUTION.



REAR VIEW OF MILITARY HOSPITAL AT CAMP HILL, HALIFAX, SHOWING FIRST WING, RUNWAY, DINING ROOMS, ETC., WITH EXCAVATION FOR VOCATIONAL BUILDING IN THE FOREGROUND.

room in the basement similar preparations had to be made. Tile floors were necessary because of the heavy wash of water from the electric baths. Continuous baths, where a patient is kept in a constantly changing tub of water of fixed temperature for possibly one, two, three, or even six or eight hours at a time were supplied. Electrically treated water affords another kind of bath for which provision had to be made. In the installation of all this special equipment the advice of the best informed experts available was called in, and many compliments have been made by the medical profession upon the excellent facilities provided for special treatments.

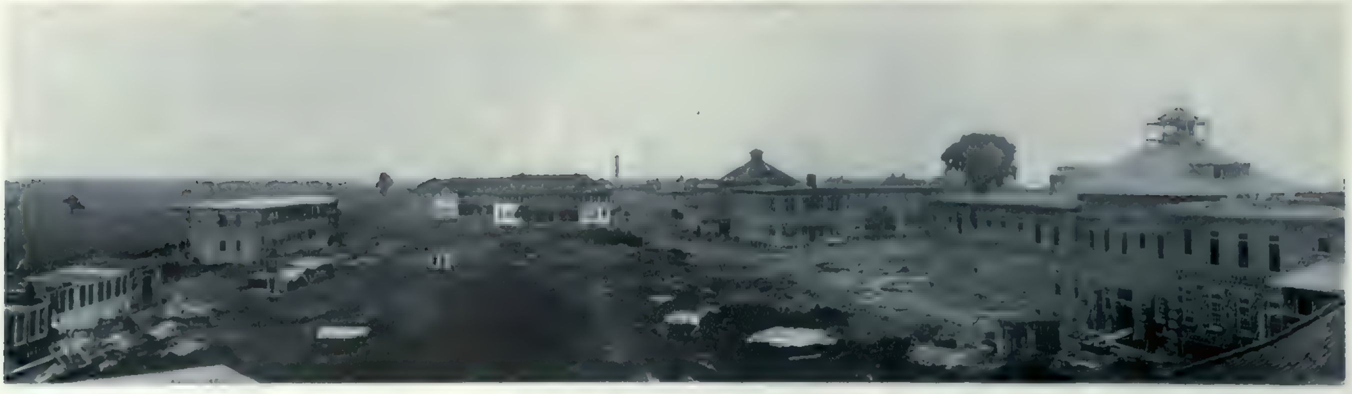


WARD ON UPPER FLOOR OF FIRST WING OF CAMP HILL HOSPITAL.

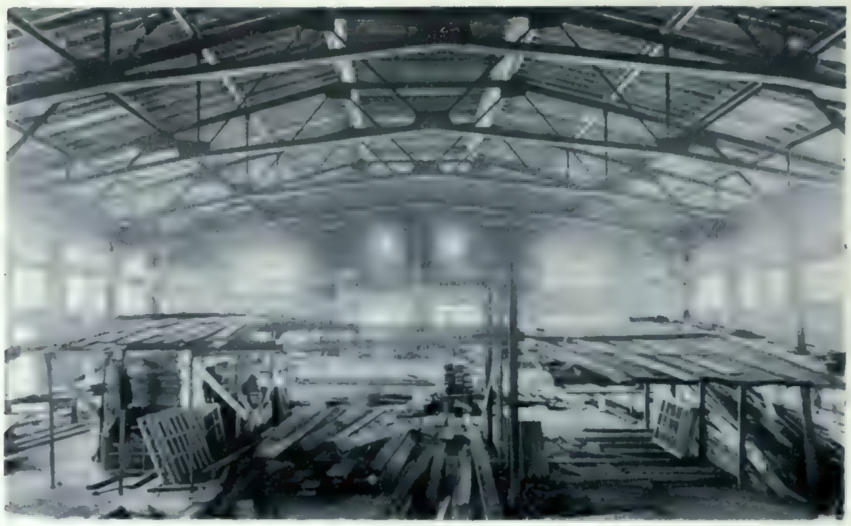
UPPER SECTION OF RUNWAY AT CAMP HILL HOSPITAL.

Making provision for the massage treatment was an important feature of adapting the Salvation Army training school as an orthopedic hospital. Four special rooms were provided with suitable plumbing. All patients are treated separately, and individual cubicles had to be arranged. In allocating the various portions of the buildings to the numerous uses, it will be observed that the architect had a big problem

ONE OF THE TOILET ROOMS IN CAMP HILL HOSPITAL BEFORE CLOSET PARTITIONS WERE ERECTED.



PANORAMA OF WHITBY MILITARY CONVALESCENT HOSPITAL. TWO PAVILIONS BEING ERECTED ARE SHOWN IN LEFT FOREGROUND WHILE THE NEW RECREATION HALL IS BEHIND THE INFIRMARIES ON THE RIGHT.



INTERIOR OF THEATRE IN RECREATION HALL AT WHITBY. THE SEATING CAPACITY WILL BE TWELVE HUNDRED.

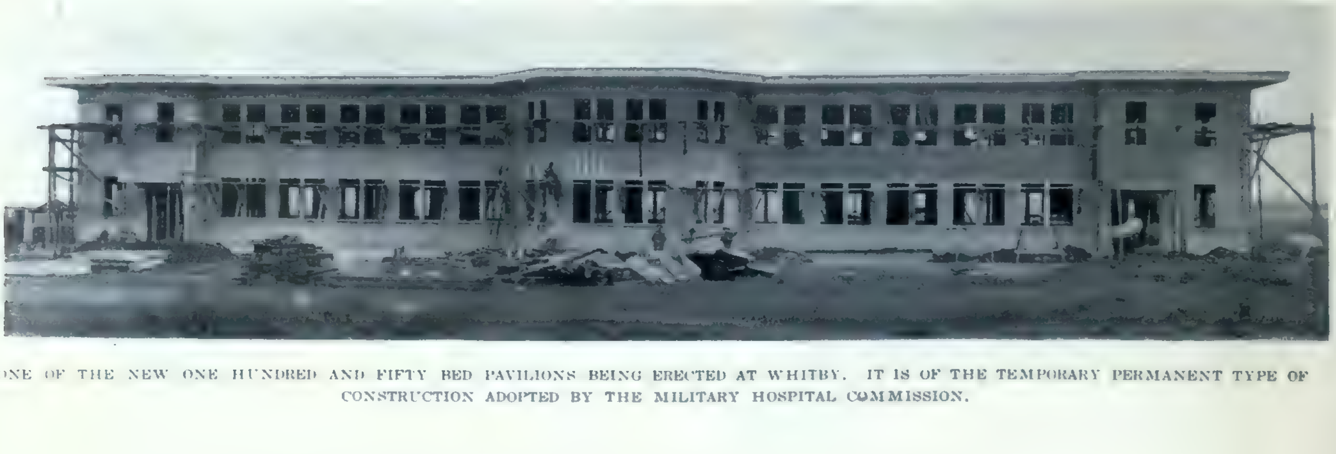
RECREATON HALL BEING ERECTED BY MILITARY HOSPITAL COMMISSION AT WHITBY. BOWLING ALLEYS, ETC., WILL BE LOCATED IN THE BASEMENT.

on his hands, as the individual requirements of all these branches were often hard to meet.

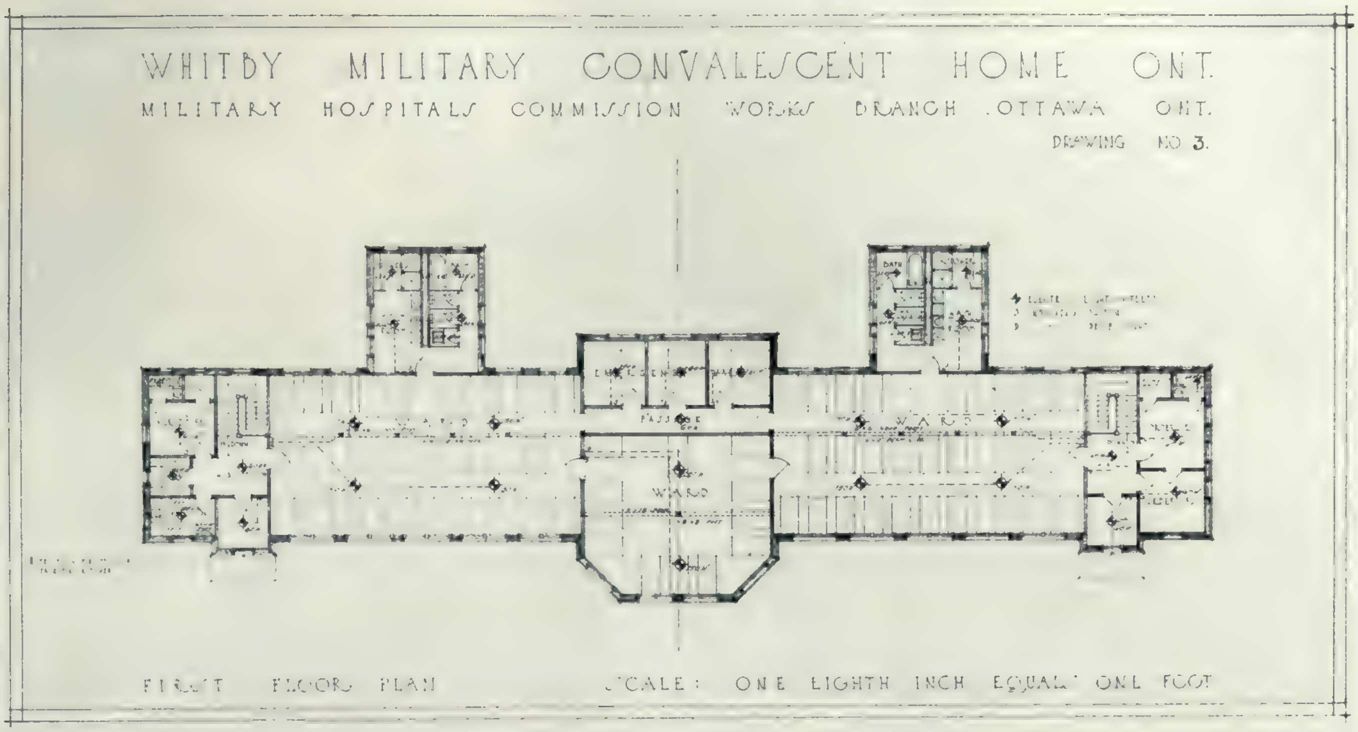
RECREATION PROVIDED FOR.

There is a billiard room at the North Toronto institution, and a large class room was temporarily set aside for general recreation purposes for the patients. It was not suitable, however, and a special building in which to centre the social life of the patients was erected. In it is a large recreation hall capable of seating five hundred people. There are four bowling alleys in the basement, and the stage of the main auditorium is equipped with dressing rooms and facilities for setting up scenery. Moving picture shows can be given there also; in fact, provision is made in nearly all the Commission's institutions for this form of entertainment of the patients. Valuable instruction is often given through this medium. On one story of this structure are the vocational training class rooms, including workshops and a garage for instruction in motor mechanics.

As will be observed from the plans and photographs printed on another page, the service building



ONE OF THE NEW ONE HUNDRED AND FIFTY BED PAVILIONS BEING ERECTED AT WHITBY. IT IS OF THE TEMPORARY PERMANENT TYPE OF CONSTRUCTION ADOPTED BY THE MILITARY HOSPITAL COMMISSION.


WHITBY MILITARY CONVALESCENT HOME ONT.
MILITARY HOSPITALS COMMISSION WORKS BRANCH OTTAWA ONT.
DRAWING NO 3.
WARD
PASSAGE
WARD
WARD
FIRST FLOOR PLAN
SCALE: ONE EIGHTH INCH EQUALS ONE FOOT

FURNITURE MAKING AT GUELPH MILITARY HOSPITAL AS PART OF RE-EDUCATION OF RETURNED SOLDIERS.

at the rear is a model of its kind. The plan was arranged by Captain Symons in consultation with Miss Violet M. Ryley, the general organizing dietitian of the M.H.C. The dining room seats four hundred patients, and smaller dining rooms are arranged along one side for officers, nurses, sergeants, and other classifications of the staff. The kitchen is under the same roof and connects with the dining room through a double width doorway, directly facing the steam serving tables. The arrangement of ranges, dishwashers, stock-pots, steam tables, refrigerators, etc., is most economical of that scarcest

OXY-ACETYLENE WELDING PROCESS USED IN REMOVING BARS FROM WINDOWS, ETC., IN ONTARIO REFORMATORY AT GUELPH.

GUELPH MILITARY CONVALESCENT HOSPITAL. FORMERLY ONTARIO REFORMATORY. NEW WINGS ADDED ON EAST AND WEST ACCOMMODATE ONE HUNDRED AND FIFTY BEDS EACH.

GENERAL VIEW OF MANITOBA MILITARY CONVALESCENT HOSPITAL AT WINNIPEG. FROM LEFT TO RIGHT ARE ROBLIN HALL, NEW HOSPITAL, ADMINISTRATION BUILDING AND DAIRY SCIENCE BUILDING.

of commodities, labor. On another page Miss Ryley tells of the considerations borne in mind while devising the lay-out of her dietary department space, not only in this, but in other of the Commission's institutions.

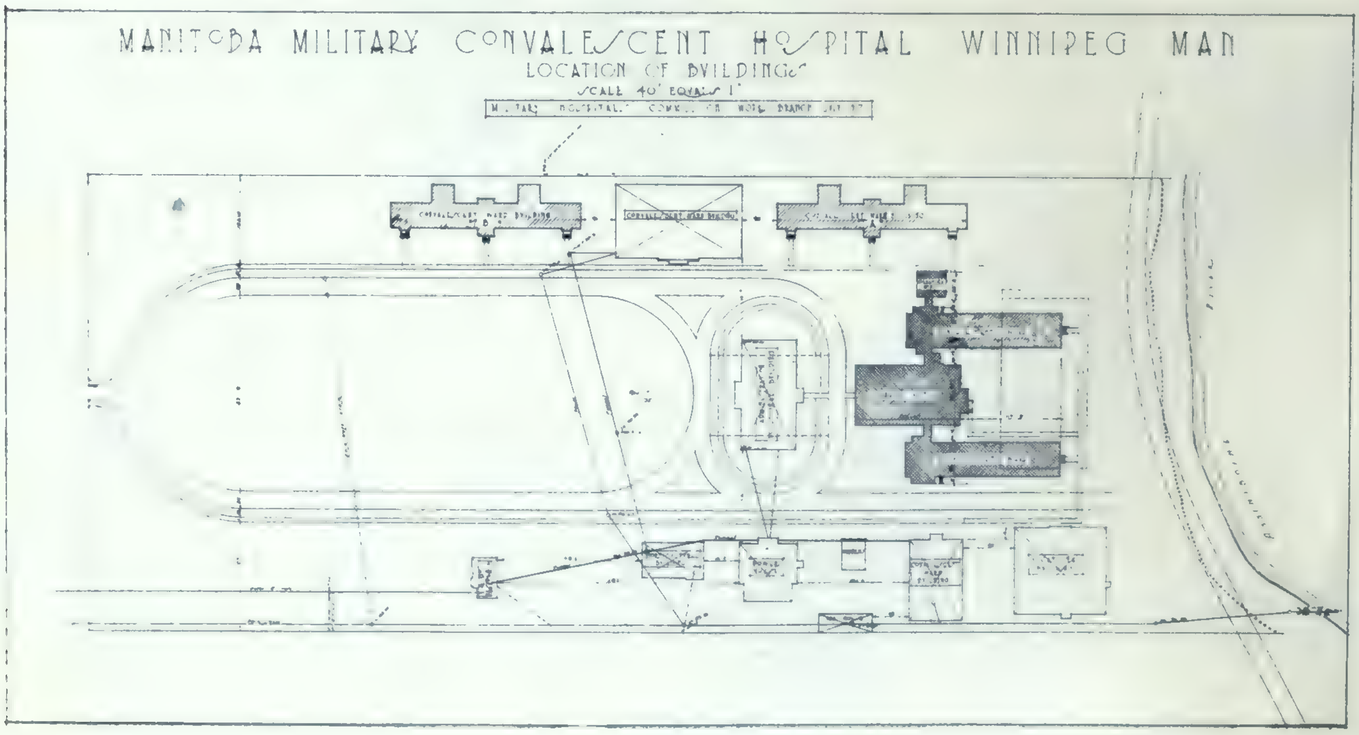
THE CONVALESCENT WARD.

At North Toronto another representative feature is developed—the convalescent ward. There are two wings of two stories containing two wards of seventy-five beds each, a total of three hundred beds. The wards run longitudinally south-east from a connecting corridor at the north-west. Immediately off the corridor is the service block, so-called, containing toilets for the patients, linen rooms, sinks, baths, showers, diet kitchens, doctors' consultation room, nurses' room, and in some cases a small observation ward of perhaps two beds for unusual cases. At the end of the ward remote from the corridor is invariably a solarium furnished with easy chairs, card tables, etc., used as a recreation and smoking room by the patients. This is entirely glassed in, but is provided with generous exits. The wide stairway leading from the upper to the lower solarium might serve as a fire-escape in the remotely possible contingency of an outbreak.

These seventy-five bed wards have been erected at several institutions and have become a typical feature of M.H.C. construction. Seventy-five beds was regarded as a convenient unit to administer, but later experience, especially with a view to the future when the military use of these buildings will no longer be necessary has evolved a slight variation of the ward arrangement. At Cobourg, for instance, the connecting corridor meets the middle instead of the end of the wing, which is thus divided into two wards of thirty-five or forty beds each. Service conveniences are provided separately for each half in a later development than the Cobourg institution, but at that place only one service block for the seventy-five beds is provided.

NEW BUILDINGS THE NEXT STEP.

As the work of the Hospital Board developed and expanded, it became necessary at times to



have large hospitals in places where there was no existing building to which such enlargements could be made. Accordingly the Commission decided to build for itself. Through the evolution of the ward wing and service wing, a type of construction had been worked out which was considered to be suitable. Experience has shown that a whole new hospital can be erected along these lines at less cost than old buildings can be adapted. The three hundred bed hospital at Camp Hill, Halifax, is the first absolutely separate hospital building started by the M.H.C., and it has proved to be so far ahead of anything else the Commission is using that it is doubtful if old buildings will ever be taken over again except in rare cases. The accommodation in this building is now being doubled by adding two new wings.

The well defined policy of the Commission for future developments in its convalescent home accommodation is shown in the illustration on the frontispiece page of a six hundred bed institution on its own grounds with separate buildings for officers', doctors', nurses', maids', and orderlies' quarters, for vocational training and for recreation.

A similar development in policy has occurred in connection with the tuberculosis sanatoria, but that subject is dealt with in another article in this issue.

Reasons for the development of such a policy will appeal to readers of CONSTRUCTION at once. The M.H.C. is carrying on several classes of work in behalf of the same patients. The medical treatment of convalescing wounded is different from that of ordinary general hospital cases. There must be several classes of expensive equipment for surgical purposes. There must be massage equipment and competent masseurs. There must be high-class medical attendance. There are the requirements of the vocational training department to be considered. The Commission's aim is to keep its patients from being hospitalized and enervated from long convalescence, and it has

OPERATING ROOMS OF NEW HOSPITAL BUILDING AT WINNIPEG.

NEW DINING ROOM BUILDING AT MANITOBA HOSPITAL.

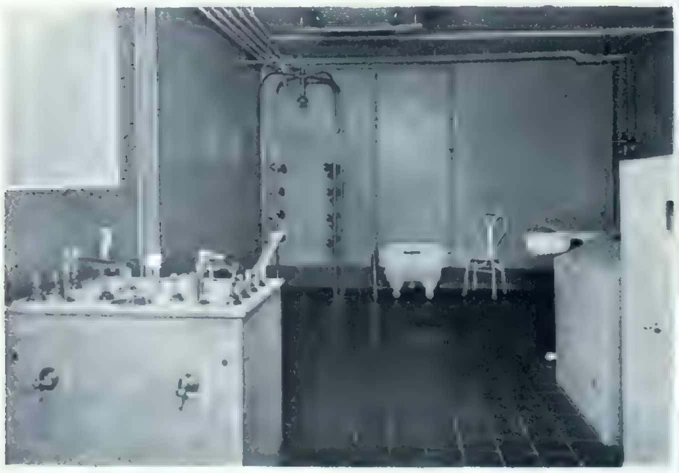
EIGHTY-FOUR BED WARD AT MANITOBA MILITARY HOSPITAL.

SUN ROOM OPENING OF EIGHTY-FOUR BED WARD.

INTERIOR OF NEW DINING ROOM AT WINNIPEG.

KITCHEN AT MANITOBA MILITARY HOSPITAL.

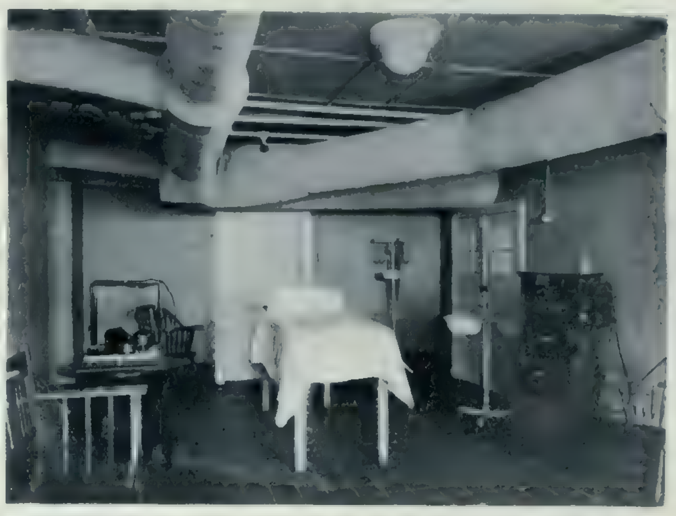
WASH ROOM AT MANITOBA MILITARY HOSPITAL.



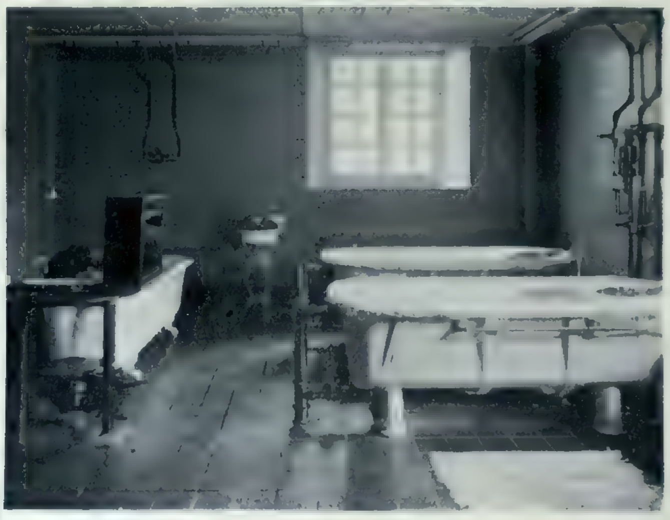
TREATMENT ROOM AT COBOURG, SHOWING NOZZLE, NEEDLE AND CABINET BATHS.

encouraged recreation of all sorts, at times appointing special officers to take charge and spending large sums of money to provide buildings and equipment for this essential feature of institutional life.

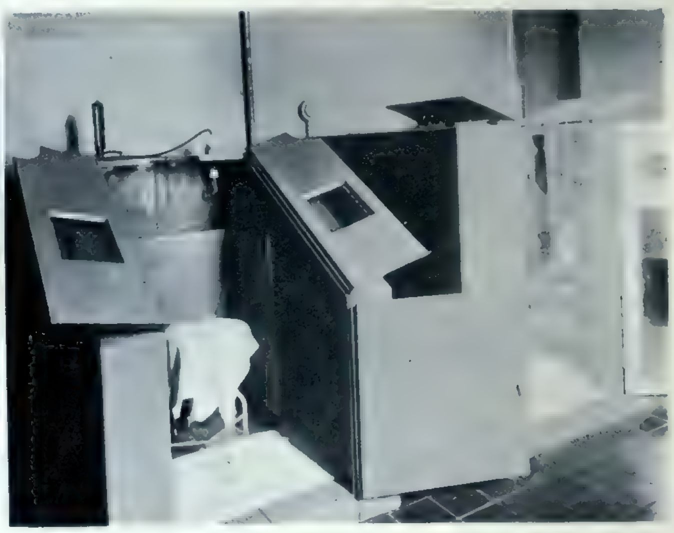
All these services can be better and more economically supplied in a large institution than in a series of small ones. A better class of



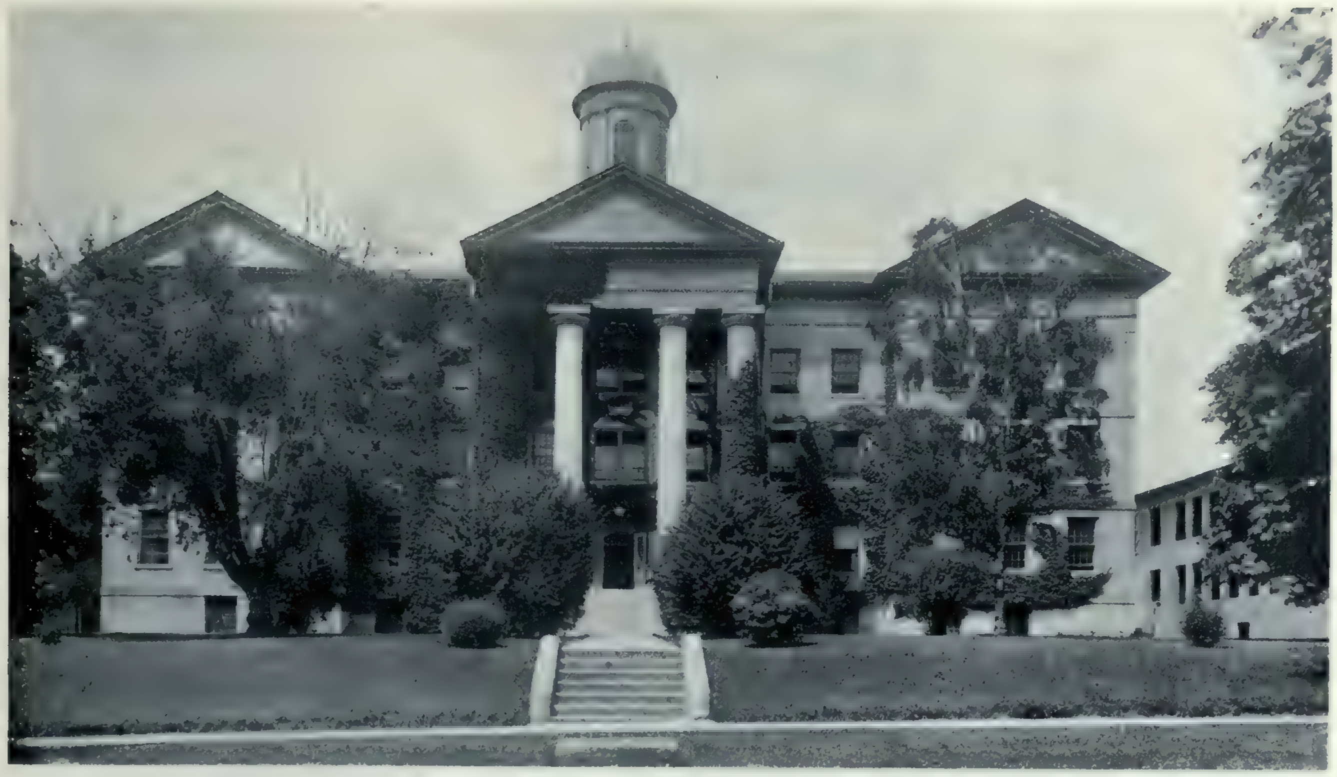
MASSAGE TABLE WITH ELECTRO-THERAPEUTIC OUTFIT AT COBOURG.



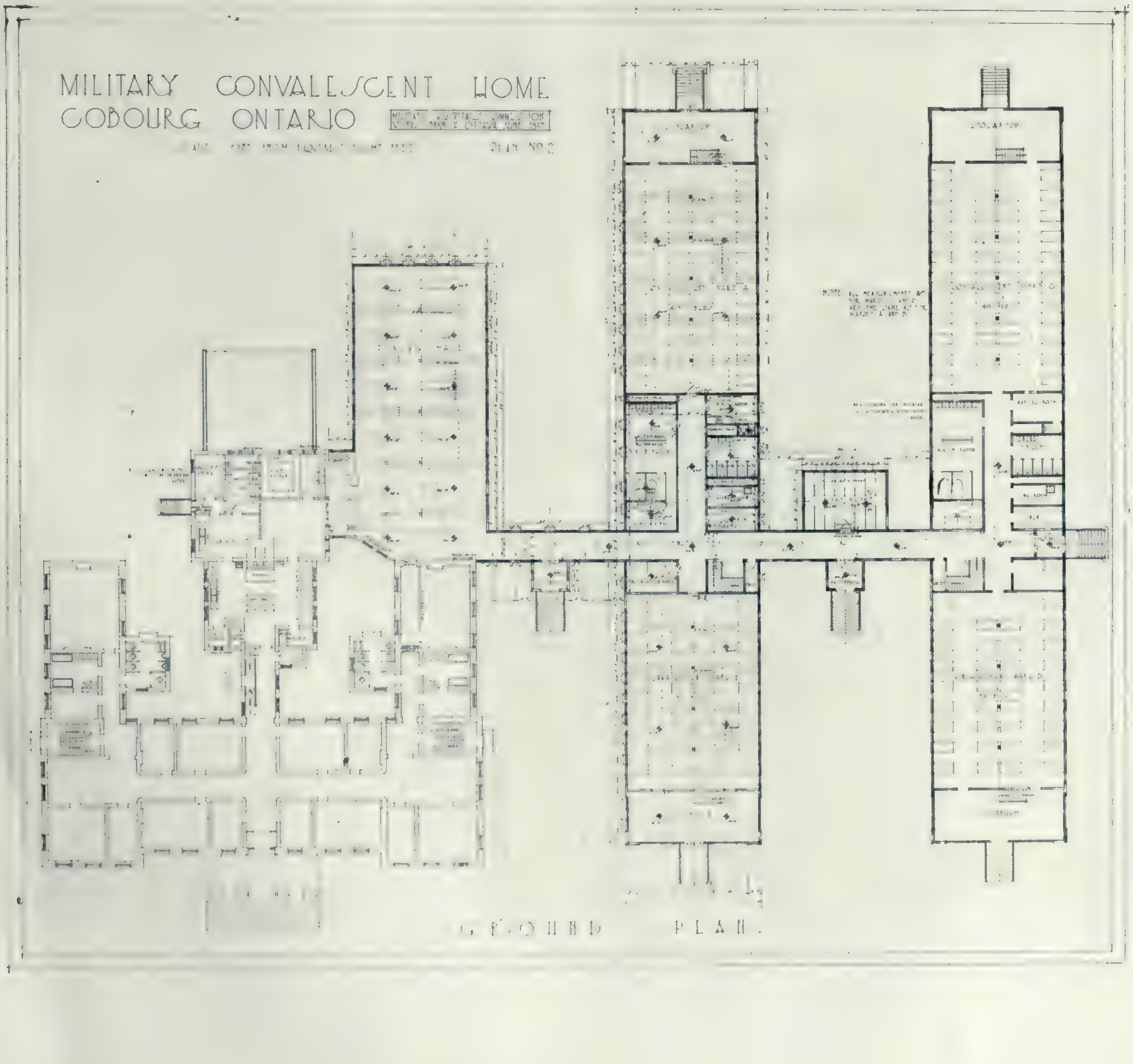
TREATMENT ROOM AT COBOURG, SHOWING CONTINUOUS BATH.



ELECTRIC BATH CABINET WITH BATTERY OF INCANDESCENT LAMPS.



OLD VICTORIA COLLEGE, COBOURG, NOW ONTARIO MILITARY CONVALESCENT HOSPITAL FOR TREATMENT OF SHELL SHOCK CASES.



NEW DINING ROOM ERECTED AT ONTARIO HOSPITAL, COBOURG.

REAR VIEW, SHOWING NEW BUILDING BEING ERECTED AT COBOURG.

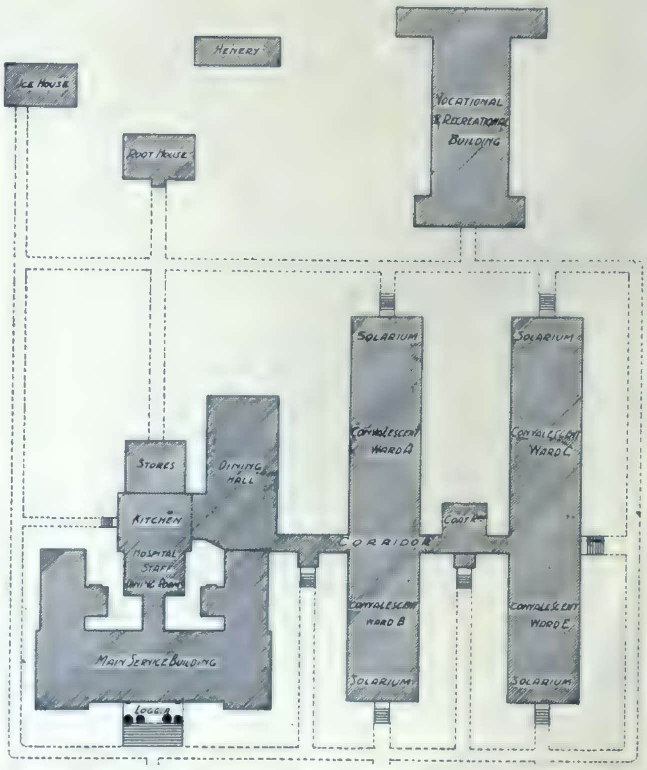
officials, medical men, *et al.*, is attracted to the large centre with its wider scope. It is a well recognized business principle that under the direction of one five-thousand-dollar a year man three one-thousand-dollar men will get infinitely better results than four men of the two-thousand-dollar class. This is the principle being applied. The reduction in proportionate overhead administration cost is enormous in these large centres as has been proved at Whitby and Winnipeg.

CHANGES AT WHITBY.

At Whitby there is already provision for six hundred patients with nine hundred more under way, and at the Manitoba M.C.H. the number of beds is seven hundred and fifty. The Whitby institution was formerly the Ontario Government's latest institution for the insane, and as described in CONSTRUCTION of October, 1916, is considered to be the most advanced development of institutional construction in the Dominion.

This Hospital was planned by the Ontario Government as a one thousand two hundred bed institution of such substantial character that its completion could not be awaited by the Military Hospitals Commission. All haste is being made, and one entire cottage group of approximately five hundred and twenty beds has already been occupied. The infirmary building is just about ready, and one or two cottages in the second group are also nearly finished. In order to accommodate the growing population of the Toronto unit, however, the M.H.C. arranged with the Ontario Government for permission to erect two special quick construction pavilions which will later be used for the accommodation of tuberculous insane. These structures are situated at the north side of the institution, and contain room for one hundred and fifty beds each. They are constructed along the lines similar to those employed in the Commission's sanatorium pavilions, but they are much larger.

The plan of the Ontario Government was to complete its cottages first and the administration and recreation buildings later. The Commission, however, had different requirements, and as a result the Provincial Secretary's department under Mr. James Govan, its architect, has rushed



BLOCK PLAN ONTARIO MILITARY CONVALESCENT HOSPITAL, COBOURG.

GRANT HALL, QUEEN'S UNIVERSITY, KINGSTON, NOW USED AS A MILITARY CONVALESCENT HOSPITAL. THE ARCHITECT WHO ERECTED THIS BUILDING SEVERAL YEARS AGO WAS CAPTAIN SYMONS, NOW CHIEF OF THE M. H. C. WORKS BRANCH.

to completion the recreation hall with several alterations necessary for military patients. Bowling alleys are being put in the basement, for instance.

At Winnipeg the old Agricultural College, later the Institute for the Deaf, was converted through the erection of one or two special ward wings and a central dining building into one of the most satisfactory institutions under the M.H.C.

INTERIOR OF KITCHEN AT QUEEN'S M. C. HOSPITAL.

At Guelph, the former Ontario Reformatory with its sixteen industries in full swing, will be another seven hundred and fifty bed institution for the re-education of men so disabled as to be unable to resume their former occupations.

NEED FOR VOCATIONAL TRAINING.

Ordinary vocational training in the convalescent homes, it should be understood, is really occupational treatment to give the patient something with which to occupy his hands and mind and to re-awaken his interest in civil pursuits. Always it should be so far as possible something useful that the patient is taught, but no attempt can be made during the ordinary period of convalescence to teach a man an entirely new trade. Most convalescents don't need it anyway. The proportion in need of re-education is small, but the length of time required for them to complete their courses will extend far beyond the ordinary period of convalescence. It may in some cases take fully two years.

The class of equipment required for this sort of work manifestly could not in justice to the country's taxpayers be duplicated in small centres all across the country. The arguments in favor of large centralization are numerous and unanswerable at this stage of the work's development, when at the present rate of progress a population of twelve thousand or fifteen thousand convalescents in the Commission's institutions is far from being an impossibility within a year's time.

NEW KITCHEN BUILDING, QUEEN'S MILITARY CONVALESCENT HOSPITAL, KINGSTON.

PRISON BECOMES A HOSPITAL.

In spite of its unique industrial equipment, the Guelph institution was not taken over without some careful thought because of its association with the idea of prisoners. As a prison, however, it was one of the most attractive institutions in America, and after some investigation it was discovered that the prison features could be entirely removed. For instance, two classes of dormitory accommodation existed—individual cells and common dormitories. The iron doors on the cells were removed, and by use of the oxy-acetelyne process all bars and screens on the entire premises were cut off flush with the wall. It would have been impossible to draw them out, but the oxy torch is so efficacious that the bars can be replaced just as securely as before. The use of this apparatus is one of the industrial features of the institution. The cells, cell corridors and dormitories have been redecorated. Better class lavatory and bathing facilities have been installed in connection with them, and the whole appearance of the sleeping quarters has been so altered that it is an open prediction that the patients will prefer the private wards (formerly cells) to the large dormitories. Lace curtains and chintz drapings have effected wonders.

WARD IN GALLERY OF CONVALESCENT HALL, QUEEN'S UNIVERSITY.

ANOTHER VIEW IN BALCONY, SHOWING HOW PARTITIONS WERE ERECTED TO PROTECT DECORATIVE WORK ON WALLS AND PILLARS.

The next institution to be erected by the M.H.C. will be the nine hundred bed scheme already referred to. No site has yet been selected, but this development may occur at any date.

NINE HUNDRED BED UNIT DESCRIBED.

It will be noted that expansion is easily possible with the building as planned by the architect. It is the intention that at first only a six hundred bed structure shall be erected, the two outside wings being added later as required, other additions being possible in the same way. The central block is for administration offices. Lateral corridors extend each way feeding thirty-eight bed wards on each side, each ward having its own service suite with toilets, nurses' office, linen room, etc., adjoining the corridor, and solarium at the end remote therefrom. Unlike the Cobourg plan illustrated, there will be service suites for each thirty-

CONVOCATION HALL, QUEEN'S UNIVERSITY, NOW USED AS A HOSPITAL WARD. ADDITIONAL ACCOMMODATION WAS OBTAINED BY ERECTING THE BALCONY SHOWN.

eight bed ward, not one group for each wing. The small structures between wings contain operating rooms, special treatment rooms, such as hydrotherapeutic, etc., cloak rooms, and so on. One of the wings is intended as an infirmary for sick cases, and its service suite is planned accordingly with diet kitchen, observation ward, etc.

Running back from the administration block is another corridor leading to the dining room, beyond which again is the kitchen and storerooms. The vocational training building, as at North Toronto, contains class rooms for commercial and general subjects, wood-working shop, garage for motor mechanics, and will usually be adjacent to grounds suitable for poultry culture and gardening.

A separate power plant at the rear is provided for, and the whole thing must be located adjacent to a railway on account of the enormous quantities of supplies which will be required daily. The transportation of patients from the train by motor is too costly an undertaking to be overlooked also.

The equipment of the hospitals has been a tremendous problem, as manufacturing has naturally suffered from the shortage of labor. The scurrying around and buying everything in sight which was necessary at first has been largely overcome by standardization now that the needs are definitely known, and large blanket orders for kitchen equipment, building materials, beds, etc., are placed well in advance of requirements.

Hospital Kitchen and Dining Room Problems

Discussion of Conditions Considered in Planning this Feature of a Convalescent Hospital, by Violet M. Ryley,[*] General Organizing Dietitian, M.H.C.

THE dietary department has six distinct parts: 1, the dining room; 2, kitchen and and serving rooms; 3, special ward serving pantries; 4, storerooms; 5, dish-washing and scullery rooms; 6, office.

The storage department is perhaps as interesting as any. In it we have a large general grocery storeroom containing the dry groceries for a month or two, with the cereals carefully protected from mice or insects in a separate, metal lined room specially constructed for this purpose. In the general storeroom certain space is assigned to the storing of case goods. Around the walls and on shelves arranged library fashion are stored canned goods (in less than case amounts) and preserved fruits. Below these shelves stand ordinary garbage cans, containing cereals in less than bag amounts, these receptacles having proved superior to bins in several ways. The bread cupboards are quite a sight to those unfamiliar with the amount required to feed hundreds of men.

The cold storage plant contains from three to five small rooms, one for fresh meats and a second for dairy products, such as milk, cream, butter and eggs, another for cold meats and left-over desserts, etc., and a fourth for fruits and vegetables. These compartments may be cooled by ice, but in some cases a small ammonia mechanical refrigerating machine has been installed. The mechanical refrigeration is particularly satisfactory because it gives a lower

HART HOUSE, QUEEN'S PARK, TORONTO, ONTARIO.

The million dollar gift of the Massey Estate to the University of Toronto, is being employed by the M.H.C. as a centre for the functional training of paralyzed and semi-paralyzed portions of the body. The work is known as "Re-education," and in some respects resembles a kindergarten for adults.

MAIN PAVILION AT TRANQUILLE MILITARY SANATORIUM, NEAR KAMLOOPS, B.C.

temperature and eliminates the labor of handling ice, a considerable item when you consider that it requires several tons a week.

The dining room is fitted up either as a regular dining room or as a cafeteria, depending upon the kind of hospital. In the orthopedic home with its many amputation cases waiters are employed. In a regular convalescent home, where the men are just resting and being built up, the cafeteria system is used. This insures faster service, as the food is always hot (or cold, if it should be cold) and the men do not have to sit and wait for anything, but carry the entire meal to a table on a little tray, thus saving time and labor. In the very large dining rooms, where several hundred can be seated at once, two cafeteria serving counters are placed so that two streams of men can be served simultaneously.

HUNDRED YEAR OLD GOVERNMENT HOUSE, FREDERICTON, N.B., BEING RECONSTRUCTED AND ADDED TO AS A CONVALESCENT HOSPITAL.

The kitchens are fitted with the latest steam and electrical equipment, such as three-compartment vegetable steamers, steam-jacketed stock pots and soup kettles, electrical vegetable parers, electrical meat choppers, even ice cream freezers and ice crushers. Men who have been denied every comfort for so long are given as attractive a diet as possible. The range and pastry oven containing four shelves, used in making desserts, would particularly interest the average person.

EUCLID HALL, M. C. H., TORONTO, ONTARIO.

The only permanent soldiers' home so far required in Canada. It has forty beds, and was the residence of the late Mrs. Massey-Treble, whose estate loaned it to the Commission. It contains a pipe organ, on which recitals for the patients are given semi-weekly.

Often it is quite a distance from the main kitchen that the wards for the men who are too ill to leave their beds are situated. Their food is served from a special serving pantry, equipped for this purpose. It contains a small steam table to keep food hot, a gas or electrical plate where an egg can be poached, a hot water and coffee urn, a small refrigerator, a sink, a cupboard, for utensils and supplies, and a tray rack, where the trays can be set carefully before the meal begins, to save time and insure quicker service.

In clearing up after a meal, the dishes are washed in an electrical dish washer and all pots and pans in large double sinks where they are cleaned in hot soapy water and rinsed in boiling hot clear water. Even the garbage tins are cleaned in a separate sink, and sterilized with live steam, to prevent odors and keep them in perfect condition.

In the office the dietitian has her desk and filing cabinet, containing a copy of all the menus served to the patients, cost records and plans of work for the

PICKERING COLLEGE, NEWMARKET, ONT., NOW USED AS A MILITARY CONVALESCENT HOSPITAL.

employees, so that there is no waste of labor.

Altogether every part is so arranged and equipped that a meal can be served in record time, and in the best of condition, with a minimum of labor and exertion on the part of the workers.

◆

Seventy-five million dollars worth of construction will be required for the cantonments for the new United States army of one million men. This sum includes about $40,000 for the erection of temporary buildings of metal, wood, and concrete, $2,000,000 for temporary hospitals, $2,500,000 for water and sewer systems, and $5,000,000 for roads.

LEEK ISLAND CONVALESCENT HOSPITAL, ST. LAWRENCE RIVER.

An American woman, Mrs. Ira A. Kip, entertains sixty wounded soldiers at her lovely Thousand Island home, which has been equipped as a hospital. An operating room with all conveniences was installed in the building shown. The boathouse is of similar construction, and accommodates about twenty of the soldiers.

EARL GREY SCHOOL AT REGINA, WITH ADDITION OF SUN ROOMS ADDED BY MILITARY HOSPITALS COMMISSION.

The Illinois Society of Architects passed a resolution which relieves enlisted members from the payment of dues, appoints a standing committee to keep a roll of those members who enlist and engages that the society individually and collectively shall guard the professional interests of enlisted members during their service to their country.

ROSS PARK SCHOOL, MOOSE JAW, NOW USED AS A MILITARY CONVALESCENT HOSPITAL.

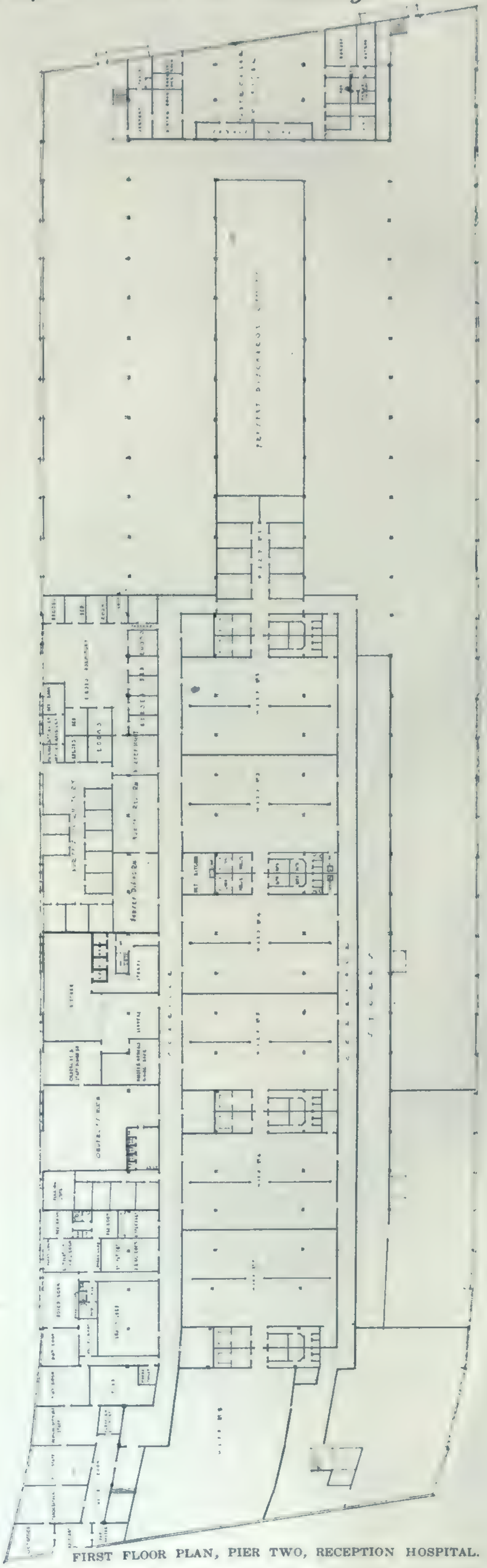
Converting Immigration Sheds Into Hospitals

Ships Bring Wounded Soldiers Alongside Clearing Hospitals Located on Piers at Halifax and Quebec—Hospital Cars on Railways

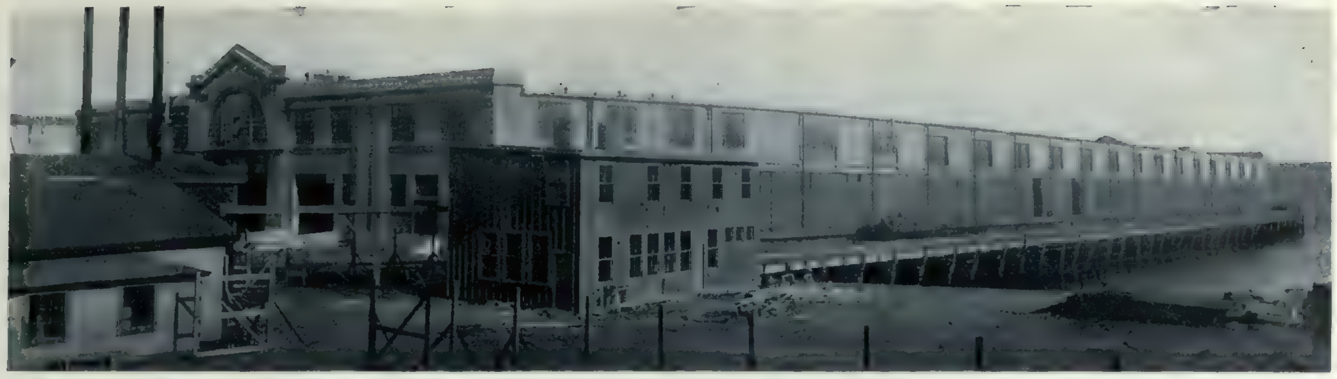
ONE of the most difficult things ever done by the Works Branch was the conversion of two huge immigration sheds into first-class hospitals. Anybody who has seen the Military Hospitals Commission's discharge depots at Halifax and Quebec will understand what a remarkable transformation was effected. It cannot be claimed in behalf of the Dominion that every effort was made to welcome the strangers at our gates in gilded palaces. The gaunt grey cement structures used as immigration buildings were about as bare of anything that would rest the eye or cheer the soul as any edifice of

SOLDIERS DISEMBARKING FROM HOSPITAL SHIP AT PIER TWO, HALIFAX.

BATHTUB ON CASTERS FOR REMOVING PATIENTS FROM BED TO SHOWER BATH AT PIER TWO, HALIFAX.



FIRST FLOOR PLAN, PIER TWO, RECEPTION HOSPITAL.



PIER TWO, MILITARY RECEPTION HOSPITAL AT HALIFAX. HOSPITAL SHIPS DISCHARGE AT WHARF IN FOREGROUND, UPPER FLOOR BEING USED AS TEMPORARY HOSPITAL. HOSPITAL TRAINS LOAD ON LOWER FLOOR.

human hands. They served their purpose, however, which was not that of a hospital.

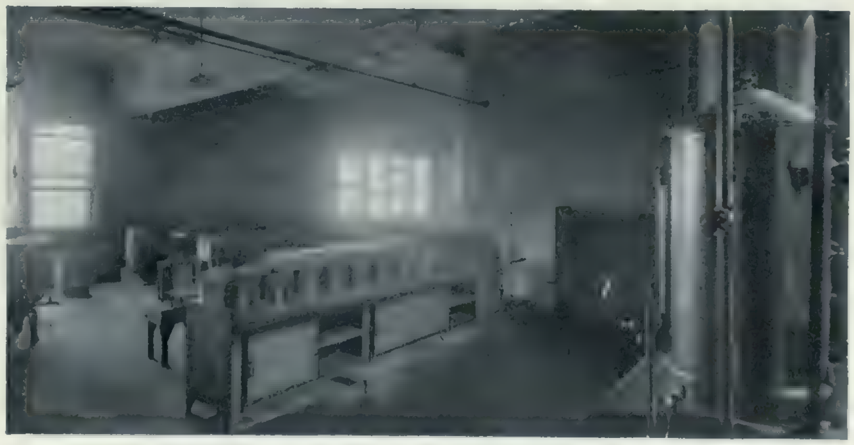
Canada's only immigrants to-day are her own maimed sons returning from the field of sacrifice, and it was but natural that these Government-owned structures, designed and placed to facilitate disembarkation of ship-loads of public wards, should have been surrendered by the Immigration Department to the Military Hospitals Commission. Both buildings were new and fireproof. They were built right out on the docks, so that ships and trains could come directly alongside. The chief handicap to be overcome was that of poor lighting, due to their tremendous width and gloomy aspect, due to absence of paint.

TYPICAL WARD AT PIER TWO, RECEPTION HOSPITAL, HALIFAX.

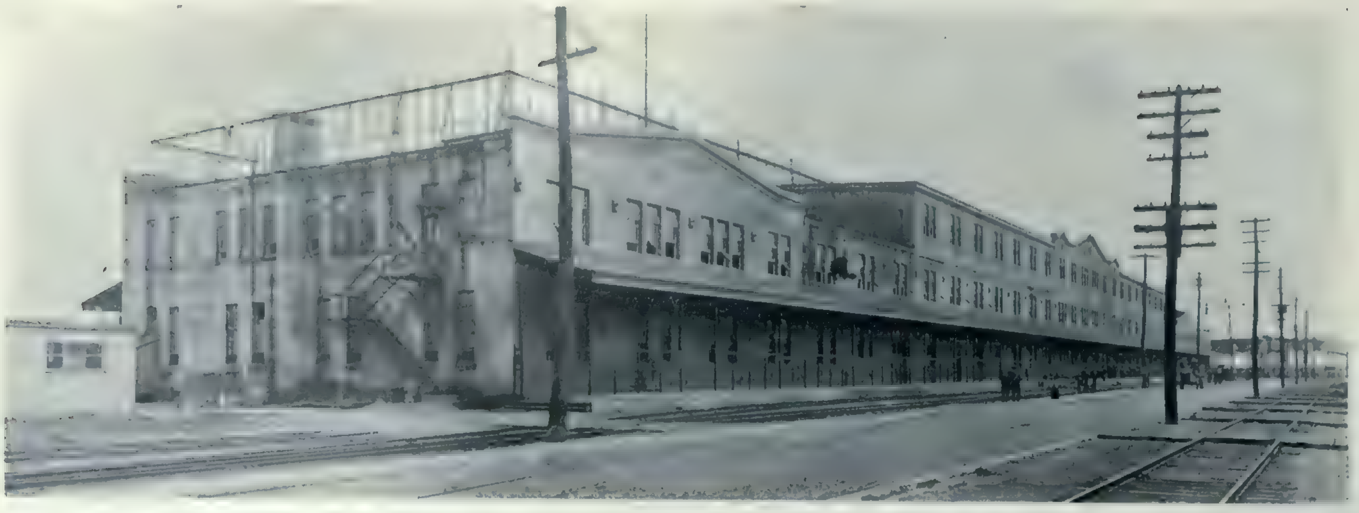
TUBERCULOSIS WARD AT PIER TWO, RECEPTION HOSPITAL, HALIFAX.

The planning has been entirely changed to meet the needs of the Commission. Both buildings are now used as reception and clearing hospitals for all classes of returning soldiers—from the mental and lung cases down to the lads whose only unfitness was the absence of a couple of years of age. In each depot a tuberculosis hospital at the sunny end of the pier has been installed. The cement wall has been opened up to make way for a glass front, and every convenience and comfort of a first-class sanatorium has been provided. At Quebec there is a roof garden, to which the beds can be wheeled through special wide doors built in by the Works Branch. Separate diet kitchens and dining-rooms have been supplied.

For ordinary patients the whole floor was divided into forty-bed ward units, each having its own lavatories, and service conveniences for nurses and patients. A large central kitchen



KITCHEN AT PIER TWO, RECEPTION HOSPITAL, HALIFAX.



DISCHARGE DEPOT HOSPITAL AT QUEBEC. TROOPS DISEMBARK AT WHARF IN DISTANCE AND ENTRAIN ON TRACKS IN FOREGROUND. UPPER TWO FLOORS ARE USED AS TEMPORARY HOSPITALS FOR ONE THOUSAND BEDS.

and dining-room, with the necessary store-rooms, was arranged in each depot. Provision for administration offices, and sleeping quarters for the entire staff, from officers down, is included on the pier. As discharge depots it is the function of these institutions to examine every man, physically and otherwise, and classify him as to his future needs at the hands of the country, which he has been serving overseas. A ship-load of 500 or 600 men can be cleared through one of these places in two or three days,

CORRIDOR IN DISCHARGE DEPOT, QUEBEC.

TYPICAL WARD FOR TEMPORARY USE AT DISCHARGE DEPOT.

The lighting difficulty in the wards was overcome at Halifax, the larger of the two sheds, by substituting glass for all the big ten by sixteen-foot roller doors with which the sides were lined for disembarkation purposes. A row of skylight wards was installed underneath the monitor, extending from end to end of the building. Two wide corridors flanked these central wards, and the outer wards are lighted from the ingeniously contrived window-doors just described. At Quebec the building was

DINING ROOM AT DISCHARGE DEPOT, QUEBEC.

KITCHEN AT DISCHARGE DEPOT, QUEBEC.

RECREATION ROOM AT DISCHARGE DEPOT, QUEBEC.

narrower, and the only aisles are at the outside. Sufficient light is thus available for ward needs. Two floors were taken over here, however, and accommodation for almost one thousand beds is available. Recreation rooms and canteens are provided at both places, but it is not intended that the men shall stay at these institutions for more than a few days at the outside, so that certain services always found in the convalescent hospitals are not available here.

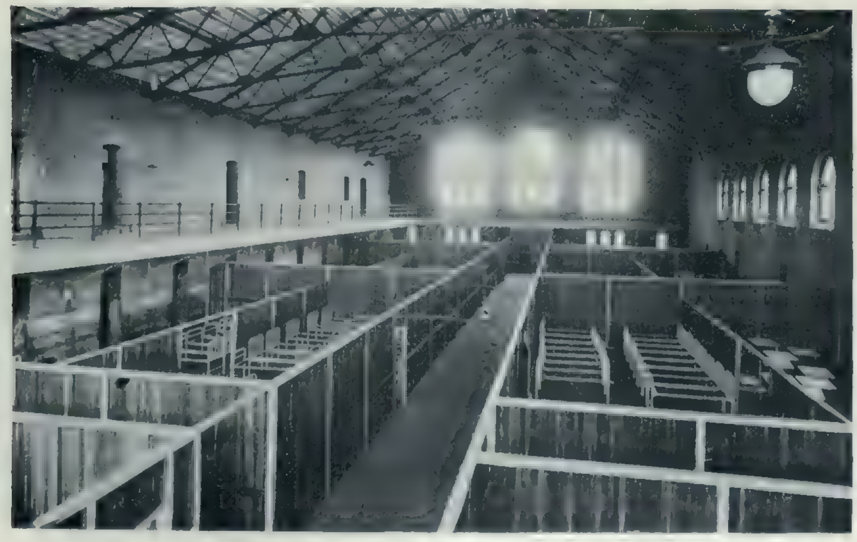
HOSPITAL CARS PROVIDED.

There have been for some time two hospital ships bringing Canadians back from the Old Country; one of these was wrecked early in August, it will be remembered, on the Nova Scotia rocks, but the patients were all removed to safety without a casualty. Owing to the awful agony entailed upon the first ship-load of returned wounded in passing them on stretchers through the windows of the ordinary sleeping cars, Captain Symons, who happened to see the first instance of that kind, obtained from the railways rough plans of their sleepers and designed a special hospital car.

Both C.P.R. and Intercolonial lines have supplied cars made from these plans, and the increase in comfort to the stretcher cases has been tremendous. Hospital trains now travel from Halifax to Vancouver without giving their passengers any greater inconvenience than they would have in a modern hospital. The cars are described as palaces on wheels. Wide double doors in the centre permit stretchers to pass in, while heavy curtains keep the cold wind out of the wards when the doors are open.

The doctor and the nurse each have accommodation, the equivalent of a drawing-room on a standard sleeper. Regulation enamelled hospital beds have been blocked into position for the patients. Diet kitchens and dispensaries are provided. Usually the cars travel in pairs, one car having all these service features, and the other having nothing but beds. The upper berths have been left in for a double purpose—to store the linen and to meet any emergency in shortage of accommodation.

WARD ON UPPER FLOOR AT DISCHARGE DEPOT, QUEBEC.



RECEPTION HOSPITAL ERECTED IN ARMORIES AT ST. JOHN, N.B., FOR EMERGENCY USE.

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A Georgia supreme court decision shows the limitations upon the authority of the architect as "agent of the owner." It declares that whether an architect as agent of the owner is to be also regarded as the owner's agent for the purpose of binding him for materials, depends entirely upon the contract between owner and architect. Also qthat whether originally so authorized or not, if the architect assumes to act as agent, and buys materials on the credit of the owner with the latter's subsequent assent, tacitly given, the owner is liable.

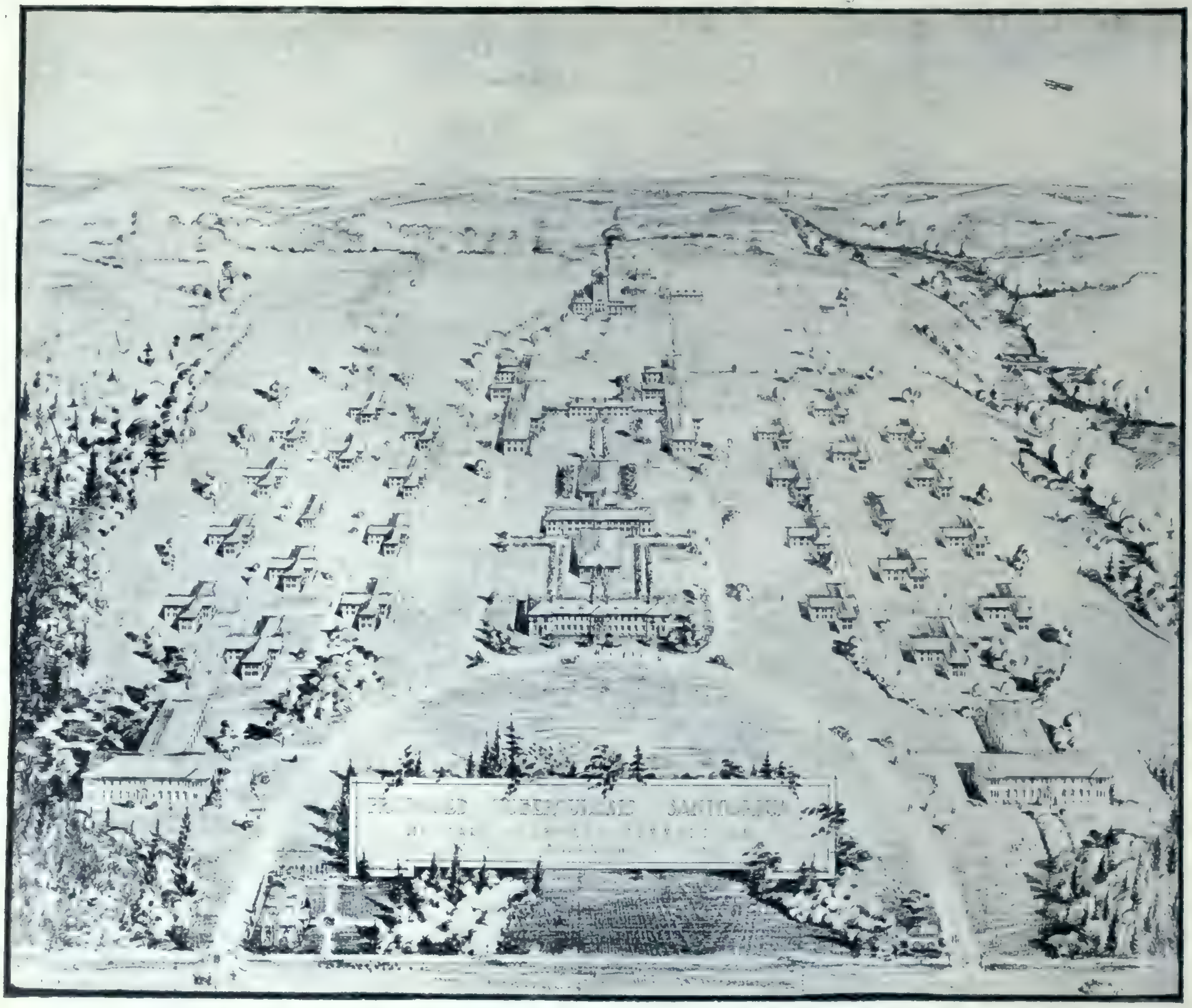
Care of Soldiers Suffering From Tuberculosis

Military Hospitals Commission is Making Big Additions to Dominion's Sanatoria for Fighting White Plague

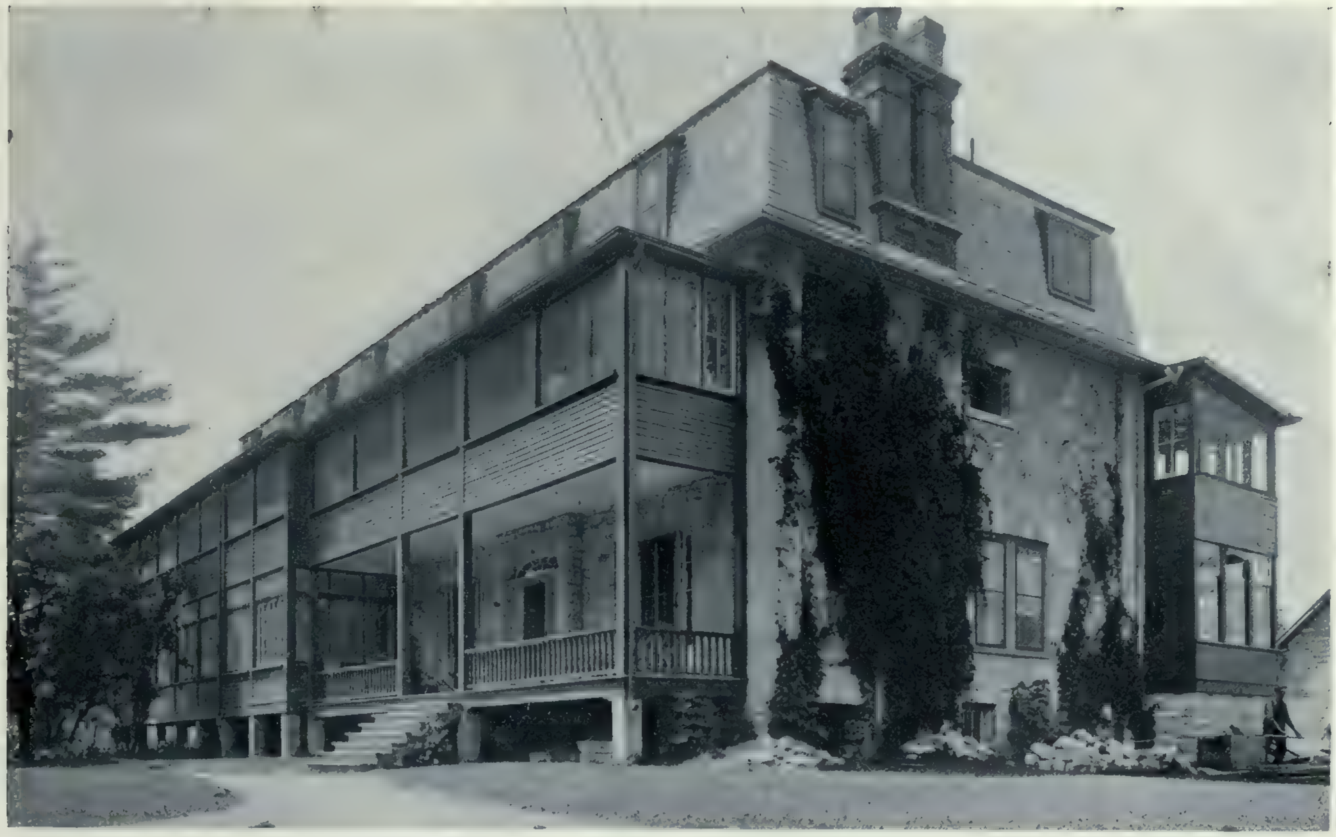
IN the course of its development the Military Hospitals Commission found that quite a number of the sick and disabled soldiers for whom it had to care were suffering from tuberculosis. Obviously it was unfair to mix these men with ordinary patients, and after a few had been sent to existing sanatoria the Commission decided to take over and develop the Sir Oliver Mowat Sanatorium as its own. This well-known institution, with its two hundred and twenty odd beds, is now probably the largest hospital combating the white plague in the Dominion.

The nucleus of the plant was a historic old limestone residence in Portsmouth, adjacent to Kingston, Ontario. Alterations were made in the main building to enlarge the kitchen and dining-room facilities, commensurately with the pavilion accommodation, which was to be supplied at once. An enclosed sun balcony was built to adapt the former residence as an infirmary for what are known as fever patients; that is, those too ill to take the ordinary sanatorium treatment. Beds are wheeled out on the balcony, as it is not contemplated that the patients get up.

In the meantime the Commission was studying the most up-to-date and widely approved plans for sanatorium pavilions. Putting the best ideas together Captain Symons finally designed a thirty-two-bed pavilion in two storeys, with two wards of eight beds on each. South-east light is an essential, and the whole front of the building is really glass, with movable sashes. For summer use the sash is thrown up, or taken off altogether and put on screens.

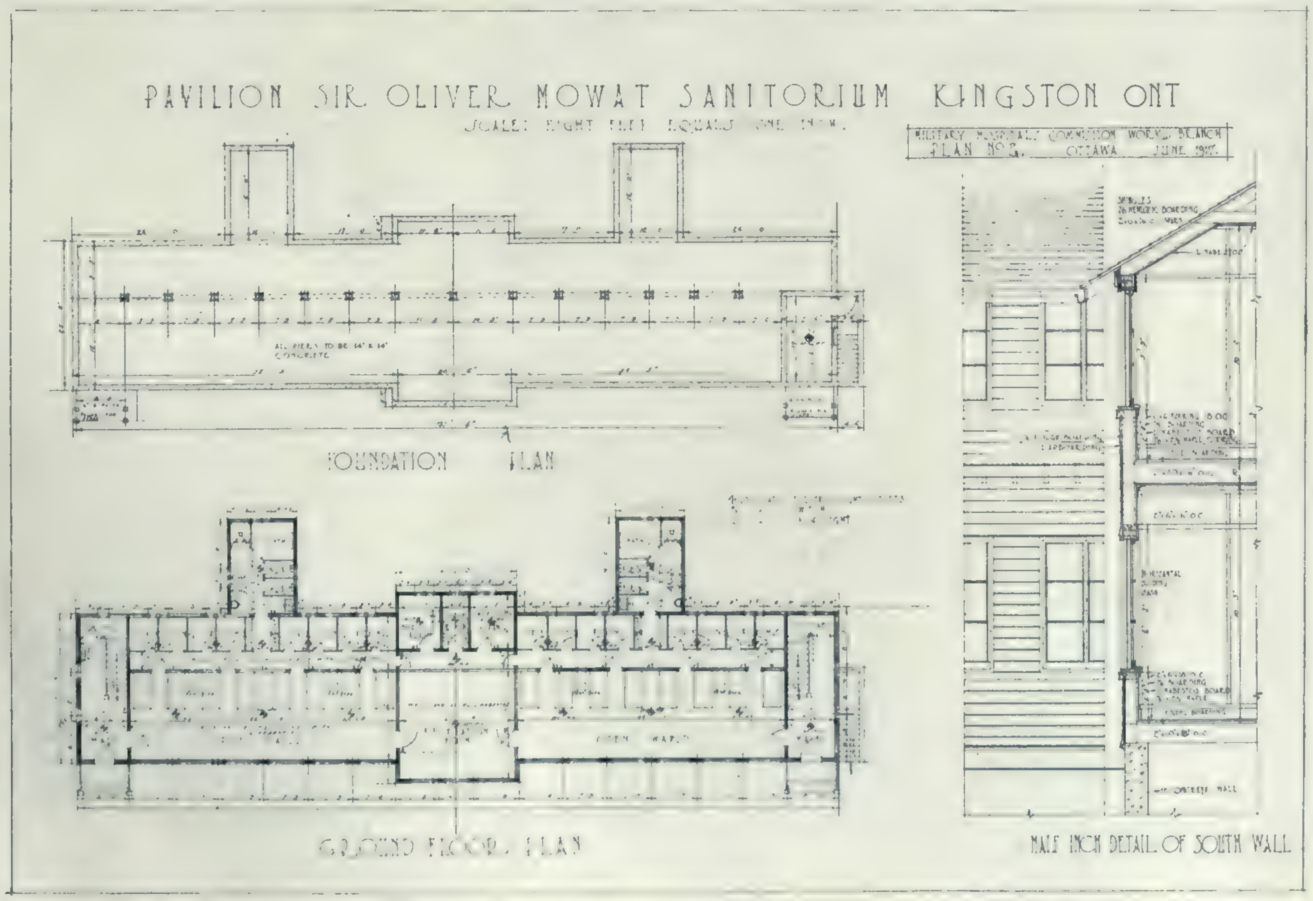


IN THIS CENTRE THE M. H. C. PLANS TO CARE FOR ONE THOUSAND PAVILION AND INFIRMARY CASES. EACH PAVILION CONTAINS FORTY BEDS, AND AS SHOWN IN THE PICTURE THEY ARE ARRANGED IN GROUPS SO THAT A FIVE HUNDRED BED SCHEME CAN BE ERECTED AT FIRST AND THEN DOUBLED.



MOWAT SANATORIUM FOR TUBERCULOUS RETURNED SOLDIERS, A HISTORIC OLD RESIDENCE WITH SUNROOMS ADDED FOR INFIRMARY USE, NEAR KINGSTON, ONTARIO.

From front to back the building is in three sections, the balcony with its reclining chairs for the use of up-patients during the day time, the bedroom with its row of beds and bedside tables, and at the rear the individual dressing rooms, which alone are heated, even in the dead of winter. Suitable clothing is, of course, supplied to the patients during the zero weather, but the air they breathe must be absolutely fresh. The eight-bed wards are separated from each other by a large recreation room, which in some cases has been built to project to the


PAVILION SIR OLIVER MOWAT SANITORIUM KINGSTON ONT
SCALE: EIGHT FEET EQUALS ONE INCH.
MILITARY HOSPITALS COMMISSION WORKS BRANCH
PLAN No 3. OTTAWA JUNE 1917.
FOUNDATION PLAN
GROUND FLOOR PLAN
HALF INCH DETAIL OF SOUTH WALL

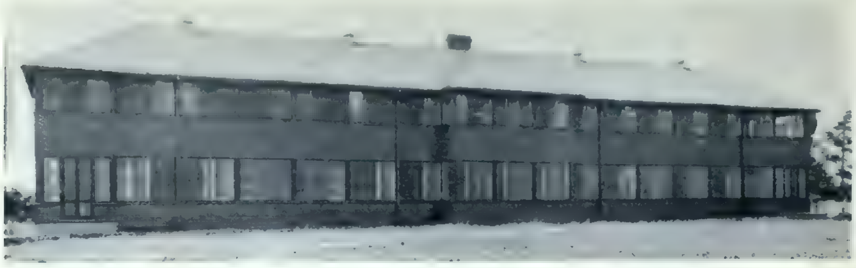
north some distance beyond the rear of the wards, giving the building a squat "T" shape. Lavatories are located in the dressing room strip, accommodation for each eight-bed ward being provided in one central compartment. In each building there is a diet kitchen and a nurses' room to assist in the service of any odd sick patients. Dining-rooms are not put in the pavilions. Sick patients are fed by trays at the bedside, and up-patients walk to a central dining-room.

VOCATIONAL TRAINING ROOM, MOWAT SANATORIUM.

At times it has been impossible to erect thirty-two-bed pavilions as fast as they were needed, and what have been called "junior" pavilions were substituted. These small one-storey structures were simply eight, ten or, as in one case, fifteen-bed wards, planned exactly the same as the wards in a large pavilion. At Byron three of these fifteen-bed pavilions have a separate building, in which all of the lavatory accommodation is placed. Individual hot water heating systems for the pavilion dressing rooms have been used in emergencies, but a central heating plant is being planned at each place.

WARD IN ONE OF THE LARGE PAVILIONS AT MOWAT SANATORIUM.

INTERIOR OF WARD IN JUNIOR PAVILION AT MOWAT SANATORIUM.


THIRTY-TWO-BED PAVILION AT MOWAT SANATORIUM ERECTED BY M. H. C.

Structurally all these pavilions, large and small, have employed similar materials to those used in the convalescent homes described on another page in this issue.

NEW PAVILIONS WILL LAST.

Something permanent for the country is being done in this tuberculosis treatment. At a conference of specialists on the disease the opinion seemed prevalent that there was no more "t.b." among the soldiers than among the ordinary population. The periodical

BEGINNING CONSTRUCTION OF LARGE NEW PAVILION AT MOWAT SANATORIUM, SHOWING SEVERAL JUNIOR PAVILIONS IN BACKGROUND.

MAIN BUILDING OF MOUNTAIN SANATORIUM, HAMILTON, ERECTED BY HAMILTON HEALTH ASSOCIATION AND TAKEN OVER BY MILITARY HOSPITALS COMMISSION.

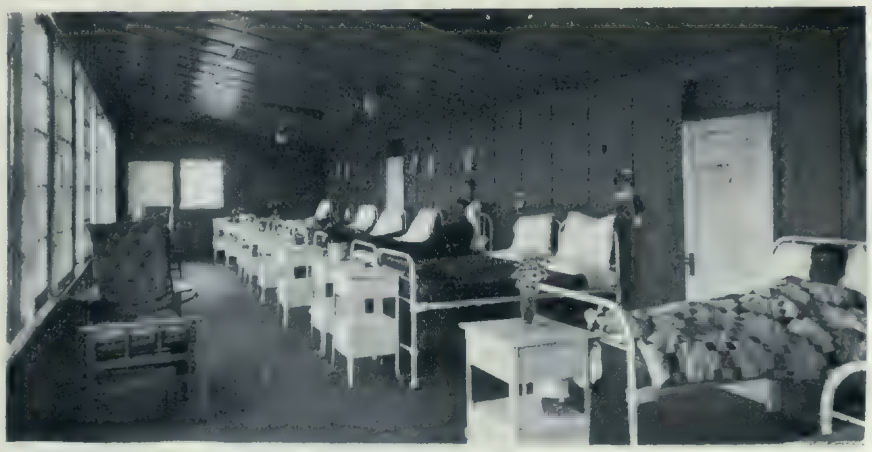
medical examinations which all soldiers have to undergo have merely disclosed the disease in greater proportions than can be detected among civilians.

In the army, detection occurs while the disease is in its incipient and easily curable stage, consequently very few cases are not ultimately discharged with the disease arrested, which in ordinary parlance practically means cured.

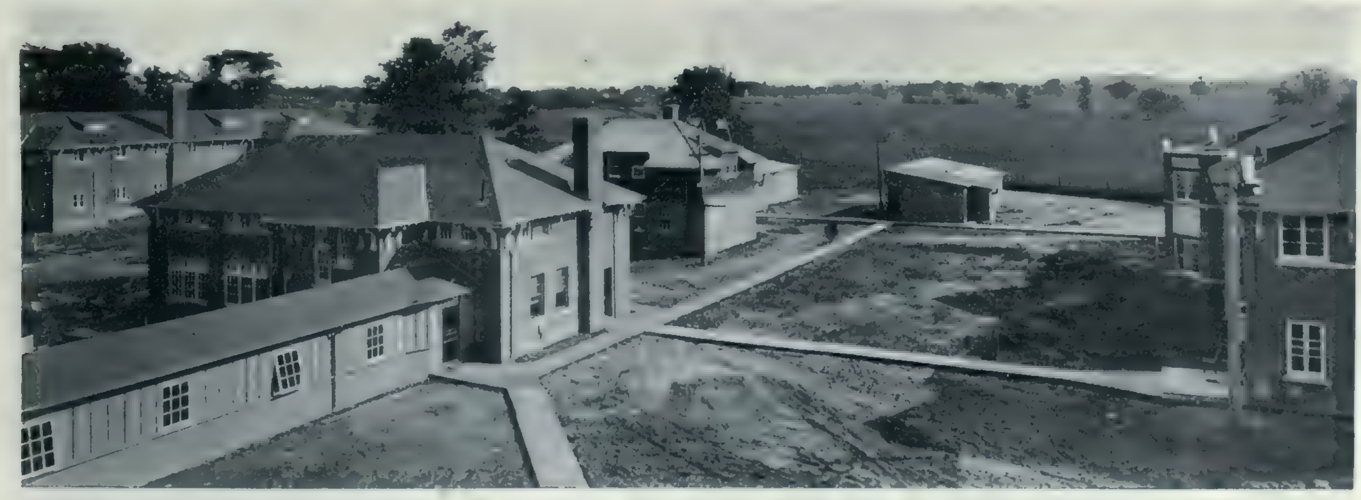
By the arrangement under which several of the Commission's sanatoria have been constructed they will eventually become the property of the existing institutions, and will be available for the continuance of civilian effort to eliminate the dread disease from the country.

At the present time the Military Hospitals Commission is caring for considerably over a thousand tuberculous soldiers in ideal sanatorium pavilions which have been erected largely by the Commission, which did not exist before the war, and which are, therefore, a permanent addi-

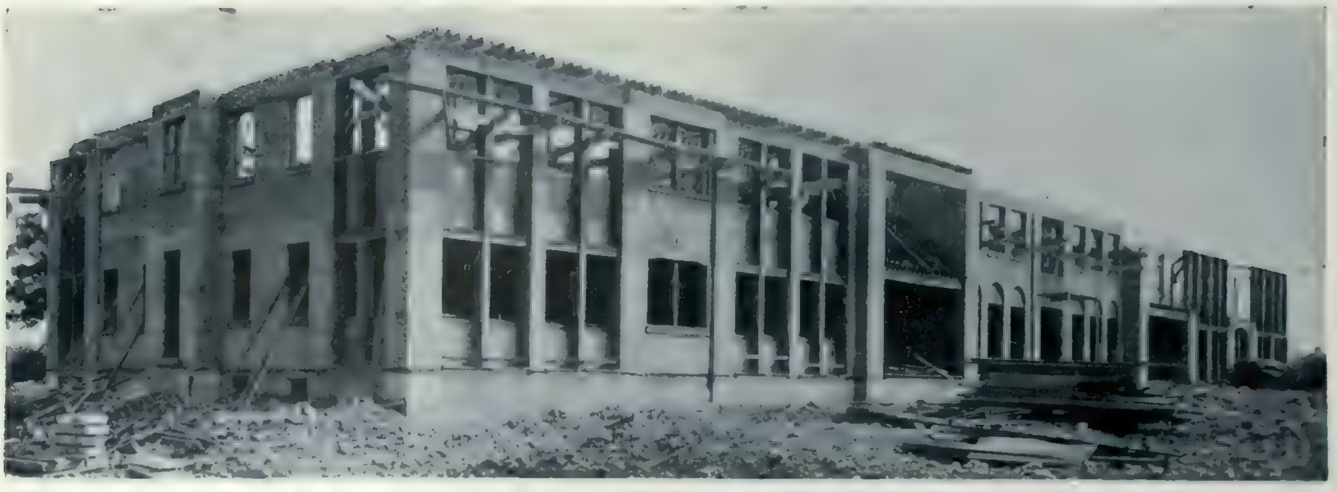
ONE OF THE NEW PAVILIONS ERECTED AT THE MOUNTAIN SANATORIUM, HAMILTON.



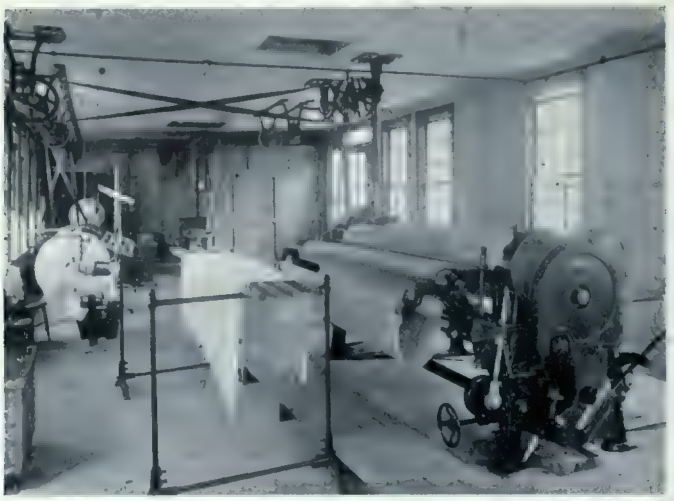
INTERIOR OF ONE OF THE WARDS AT THE MOUNTAIN SANATORIUM.



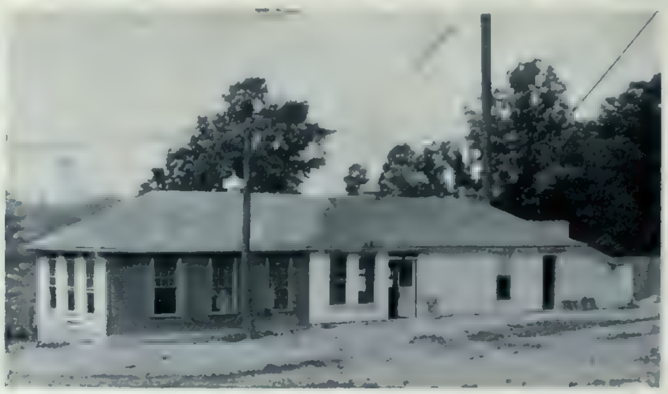
BIRD'S EYE VIEW OF NEW BUILDINGS ERECTED AT MOUNTAIN SANATORIUM. DINING HALL AND SERVICE BUILDINGS IN CENTRE, AND NEW PAVILION ON EACH SIDE.



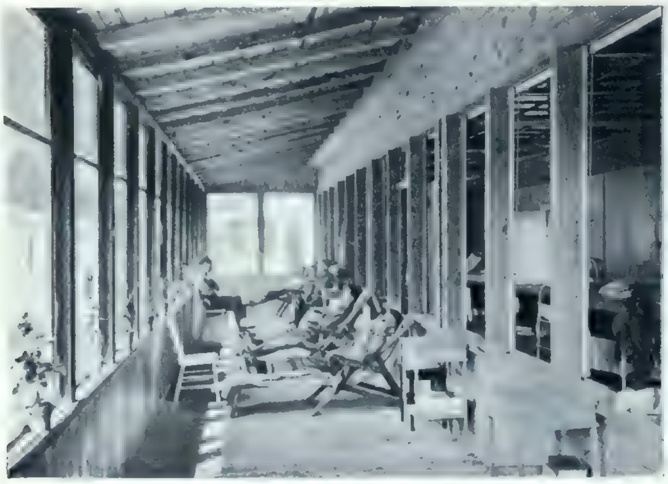
NEW BRICK INFIRMARY BEING ERECTED AT BYRON, NEAR LONDON, BY MILITARY HOSPITALS COMMISSION AND LONDON HEALTH ASSOCIATION.



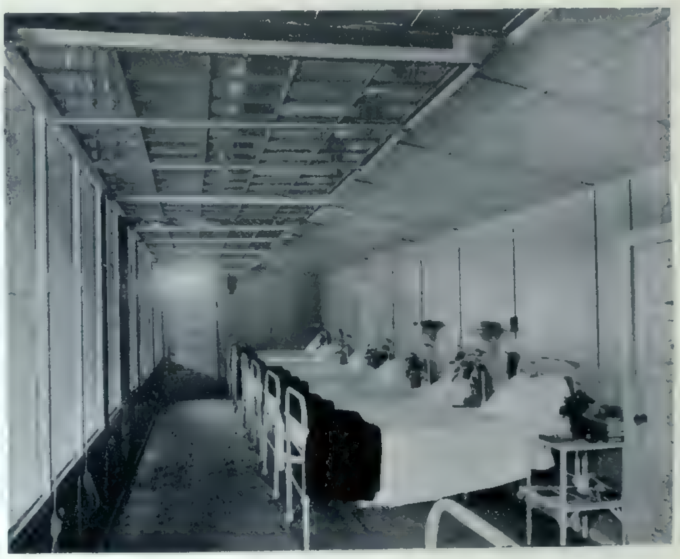
INTERIOR OF LAUNDRY AT BYRON SANATORIUM.



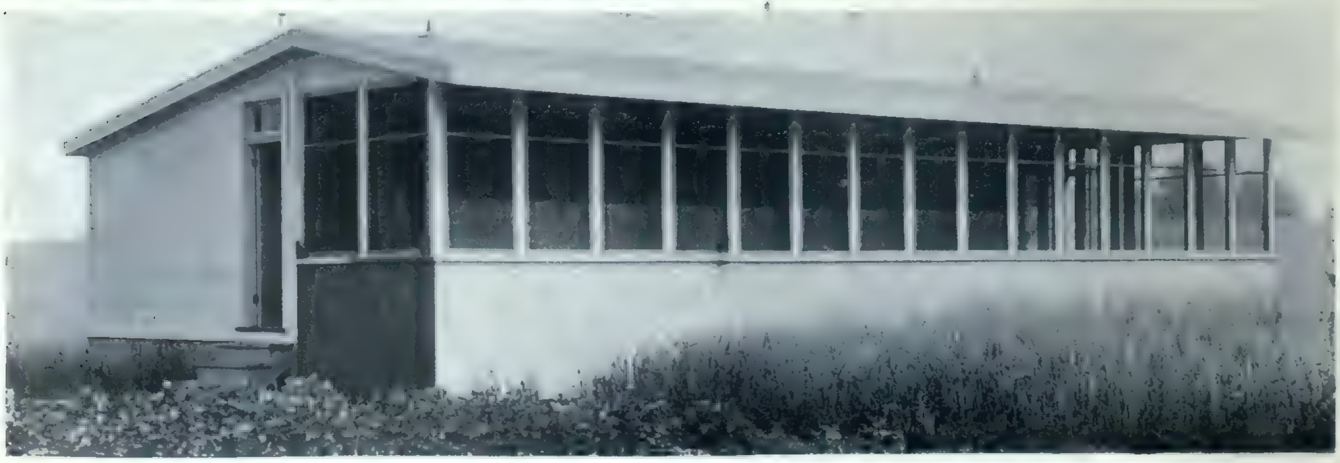
LAUNDRY BUILDING (SHOWING NEW ADDITION) AT BYRON.



PORCH IN SMALL PAVILION, BUILT BY M. H. C. AT BYRON.



WARD IN JUNIOR PAVILION AT BYRON SANATORIUM.



JUNIOR PAVILION ERECTED AT BYRON SANATORIUM BY MILITARY HOSPITALS COMMISSION.

THIRTY-TWO-BED PAVILION AT KENTVILLE SANATORIUM.

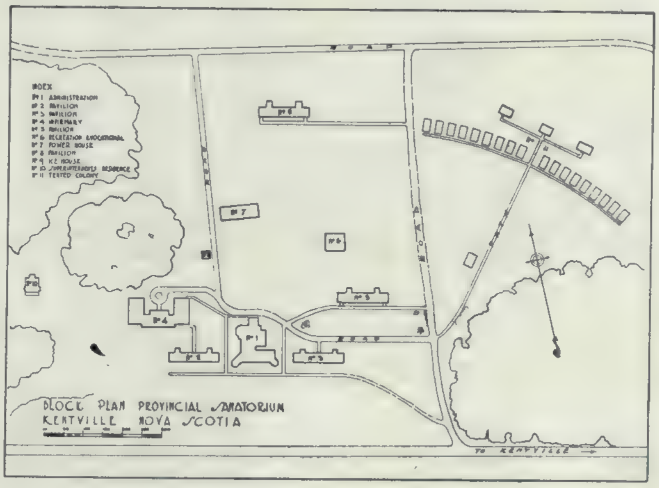
tion to the nation's anti-tuberculosis munitions.

In one or two cases, as at the Queen Alexandra Sanatorium, Byron, near London, Ontario, the local board has not been content to add to its plant so temporary a structure as is sufficient for the needs of the Commission. Accordingly funds have been raised in other ways to make up the difference between frame and brick construction, the Commission putting in an amount which experience elsewhere has shown would meet its requirements. By this it should not be understood that the Commission's pavilions will last for only four or five years. In most sanatoria, Military Hospitals Commission construction is just as substantial as the previously existing buildings.

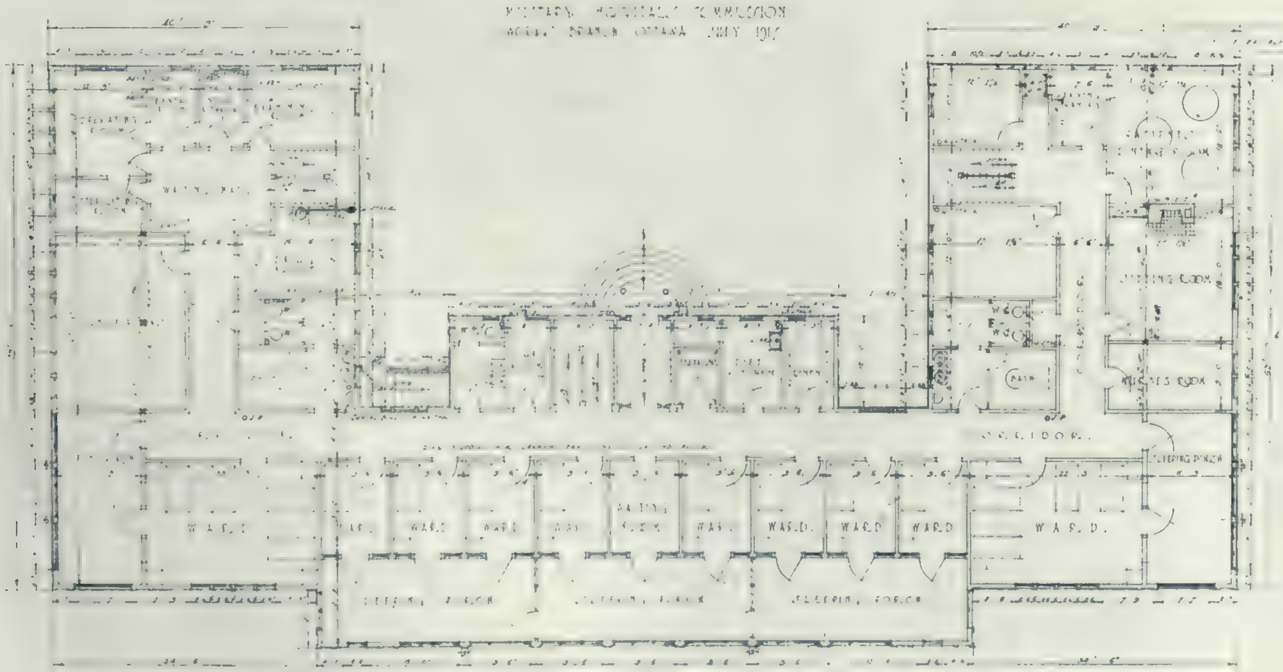
LARGE CENTRE IS PLANNED.

On another page is published a representation of a one thousand-bed sanatorium, such as the Commission contemplates building in the near future. No site has been selected, but considerations of economy in administration have led to a decision to centralize this work. Two five hundred-bed groups of pavilions, almost exactly the same as existing pavilions erected by the Military Hospitals Commission, are contemplated, the chief variation being that the wards will contain ten instead of eight beds, giving the pavilion accommodation for forty instead of thirty-two patients. Centrally located, so as to be convenient to each group, is a small service building, containing dispensary and other requisites of the medical and nursing staff.

The administration building is located between the two groups, and north of it will be the dining and kitchen building. A large infirmary building for each group, with accommodation for perhaps one hundred beds, is shown at the rear of the dining-room. It will provide for



INFIRMARY BUILDING PROVINCIAL SANITORIUM KENTVILLE, N.S.

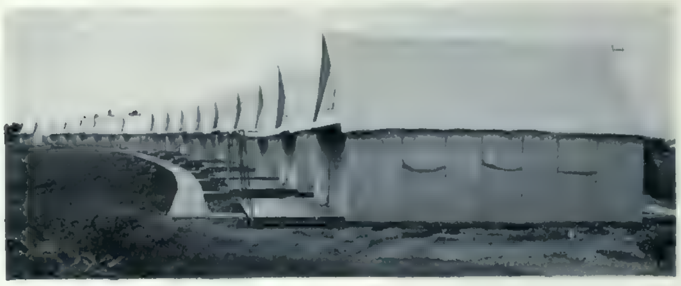


GROUND FLOOR PLAN.

the treatment of the more serious cases. Recreation buildings, vocational training shops, power plant, officers' and nurses' residences, orderlies' quarters, etc., are provided, arranged in separate buildings. Owing to the nature of the institution there is a lodge at the gate.

Only one group of five hundred beds will be built at first, it is anticipated, but the intention is ultimately to have a centre of twice that size.

A peculiarity of this group is its orientation. As at Whitby, symmetry is abandoned to a certain extent in order that all wards may face southeast. The infirmary, it will be noticed, contains a central administration block connected by corridors, one running east and the other west, to two well-lighted ward buildings, each facing in the same direction.



TENT COLONY AT KENTVILLE SANATORIUM, TENTS HAVE WINDOWS, LAVATORIES AND RUNNING WATER.

THE KENTVILLE TENT COLONY.

Emergencies arise even in well ordered communities. A nation at war can hardly be called a well ordered community, so that it is only natural that emergencies should occur more often than usual in Canada just now. Recently the Military Hospitals Commission was faced with a "real live" one, and one that had to be met in an exceedingly limited time. Sudden warning was received that within a few numbered days a hospital ship would discharge at Halifax many more tuberculous patients than the Commission was expecting, and than it could under existing circumstances accommodate in suitable sanatoria. The steps taken to meet this situation form one of the most interesting chapters of the Commission's experiences.

TUBERCULOSIS WARD AT DISCHARGE DEPOT, QUEBEC.

TAKING THE CURE AT KENTVILLE SANATORIUM.

Complete housing for one hundred and sixty tuberculosis patients was provided in eighteen days at Kentville Sanatorium. The use of canvas was necessary, but full toilet, ablution and recreation services, together with housing for nurses, doctors and orderlies, was provided. Eating accommodation was available at the central dining-room of the sanatoria.

The place selected for the colony was peculiarly suited to the proper arrangement of the tents from the standpoint of orientation, appearance, drainage and supervision. At the rear of the sanatorium grounds there is a flat plateau like a piece of sod. About fifty feet above the general elevation a portion of this at the northeast corner curves around in a perfect crescent, while in front, but at the lower elevation, so as not to obstruct the view, is a clump of pines. The tents were laid out on a thirty-foot centre and on a six degree curve, which exactly suited the crescent shape of the brow of the hill. A radial line was struck in the middle of the arc. On this line at the rear was located the ablution tent. On the low level, and on either side of this same axis, were placed the nurses' and orderlies' tents. The patients' tents were sixteen by twenty-four feet in size, with seven-foot walls. The tents were erected

SUN BALCONY, LAURENTAN SANATOIRIUM, FOR TUBERCULOUS RETURNED SOLDIERS, STE. AGATHE, QUE.

CANADIAN HOSPITAL TRAIN OF TWO CARS.

on two by four framing, and stretched rigidly over it. Each tent was provided with a ply, and had two ventilators in the top, with weather flaps. There were also two weather flaps at the ends, and eight windows, four in each side, each provided with weather flaps and draw blinds. The walls were lined with ten-ounce duck. It was contemplated to use windows in the openings, but this was decided as unnecessary. Each tent has a seven-foot flap at each end, which is raised on poles to form a sunshade. The tents were floored with rough boards on joist, tar paper, etc. No. 2 maple was used. The floors extended seven feet at each end to form verandahs under the flaps.

The ablution tent was constructed similarly, and was provided with lavatories, water closets, showers and tooth basins to accommodate one hundred and sixty men. The sewer was connected four hundred and fifty feet away to the sanatorium sewer. The recreation tent had no structural peculiarities different from the others. The nurses' tent had separate toilet and ablution conveniences, including six separate cubicles, and a sitting room. Accommodation for two doctors was provided in one tent similar to the nurses'. The orderlies' tent was also similar to the nurses', except that it had no separate cubicles.

INTERIOR OF C. P. R. HOSPITAL CAR.

This complete little sanatorium ideally suited for the treatment of the disease, was completely ready for occupation by one hundred and sixty men in eighteen days.

CONFERENCE OF EASTERN CANADIAN TUBERCULOSIS SPECIALISTS TREATING MILITARY HOSPTIALS COMMISSION PATIENTS, HELD AT OTTAWA ON JUNE 18TH AND 19TH.

Front Row—Major J. T. Todd, Pensions Board; Senator J. S. McLennan, member M.H.C.; Dr. F. J. Shephard, ex-Dean of Medicine, McGill, member M.H.C., who presided at Conference; Senator Sir James Lougheed, P.C., K.C.M.G., President M.H.C.; Lt.-Colonel A. Thompson, M.P., Medical Superintendent M.H.C.; Sir James Grant, M.D.

Second Row—Captain Ed. Ryan, M.O. "D" Unit, M.H.C.C.; Dr. J. H. Holbrook, Medical Superintendent Mountain Sanatorium, Hamilton; Dr. L. H. Farris, Medical Superintendent St. John's County Hospital for Tuberculosis; Dr. C. D. Parfitt, Medical Superintendent Calydor Sanatorium, Gravenhurst; Lt. A. F. Miller, M.O., Kentville Sanatorium; Dr. P. H. Bryce, Chief M.O. Department of Interior; Captain J. D. Byers, M.O., Laurentide Inn M.H.C., Laurentian Sanatorium, Ste. Agathe, P.Q.; Captain D. A. Craig, M.O., Byron Sanatorium, London.

Half Row Beginning in Centre—Lt.-Colonel J. J. Sharples, C.O., M.H.C.C.; Lt. J. A. Couillard, M.O., Lake Edward Sanatorium, P.Q.; Dr. W. M. Garrison, Dalton Sanatorium, P.E.I.; Captain S. E. Thompson, M.O., Mowat Sanatorium, Kingston.

Next Row—T. B. Kidner, Vocational Secretary, M.H.C.; E. H. Scammell, Secretary, M.H.C.; Captain G. D. Porter, Secretary, Canadian Association for the Prevent'on of Tuberculosis; Dr. A. D. Proctor, Medical Superintendent, Freeport Sanatorium, Kitchener; Dr. J. H. Elliott, Toronto; Dr. D. Townsend, Medical Superintendent, Jordan Sanatorium, River Glade, N.B.; Captain W. Ogden, Medical Officer, Spadina M.H.C., Toronto.

Back Row—Dr. W. W. Chipman, Assistant Medical Superintendent, M.H.C.; Dr. W. B. Kendall, Medical Superintendent, Muskoka Sanatorium, Gravenhurst; Dr. J. K. M. Gordon, Medical Superintendent, Royal Ottawa Sanatorium; W. A. Charlton, Toronto; W. F. Moore, Staff, M.H.C.

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NEW LICENSING LAW OF IDAHO

In an opinion rendered by the Attorney-General's office of Idaho it is held that under the law regulating the practice of architecture which was passed by the last Legislature no distinction can be made between architects whose offices are in another State and those whose offices are in Idaho, so long as they practise their profession in this State.

It is further held that any architect who was engaged in the practice of his calling at the time of the passage of the act is entitled to a license without examination, irrespective of where his offices may be maintained.

The construction of the law is said to be contrary to the intentions of the Idaho Association of Architects, which was instrumental in having it enacted.

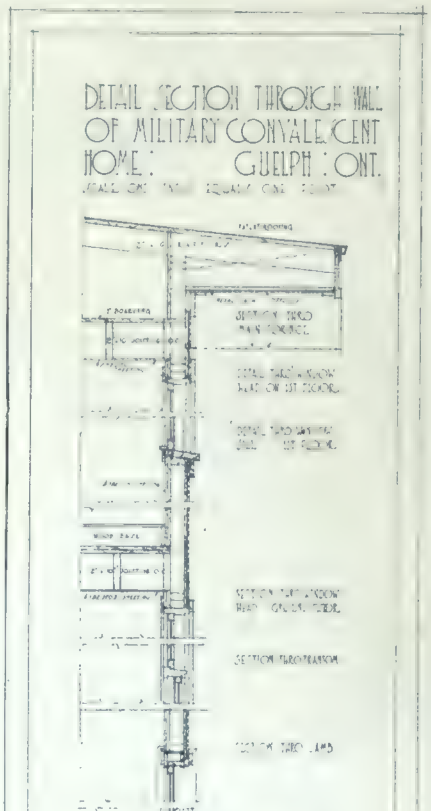
System of Hospital Construction Described

By J. H. W. Bower

EDITOR'S NOTE.—Speed has been an essential consideration in Military Hospitals Commission construction. Mr. J. H. W. Bower, assistant in charge of the Works Branch, in the following article tells about the style of construction adopted to obtain this result. The buildings are needed by the M.H.C. for a very limited number of years, but it is likely that uses will be found for them afterwards. A really temporary building would not have been good enough for the Commission's work, although on the other hand massive durability is no requisite of the present situation. Some fast work has been done by Captain Symons' staff and contractors. A thirty-two-bed pavilion for tuberculosis patients was completed in six weeks at Mowat Sanatorium, Kingston, during the winter months. A complete three hundred-bed hospital with kitchen and dining room accommodation was begun at Winnipeg by Thomas Sharpe, the contractor, in zero weather with eight feet of frost in the ground. It was occupied and the steam turned on exactly eight weeks from the day the first bit of frozen earth was chipped off. Pier Two at Halifax, a huge cement immigration shed, was made ready for the occupation of two hundred and forty patients in four weeks. Provision for one hundred and sixty men was made in tents, with all plumbing and drainage installed as if for a permanent building in eighteen days at Kentville Sanatorium. It is estimated that a six hundred-bed hospital with power plant, officers' and staff's residences, vocational building and recreation hall can be completed in three months, providing always that labor and supplies are available in the desired quantities.

DISCUSSING only convalescent homes, it should be noted that these have been constructed in a semi-permanent manner only, and are styled temporary buildings. This term is incorrectly applied, however, as our buildings are of necessity somewhat better than temporary structures, and have been put up in such a way that they can readily be changed into permanent buildings.

Foundations for these buildings have been of the post and sill type, that is to say, excavation has been made below frost level to suitable foundation, and a four by four by one foot concrete slab poured thereon. On the concrete rests a six inch grillage, composed of three inch timber two-ply thick running at right angles to each other. To the timber grillage is then applied the post, which is usually a ten by ten inch or a twelve by twelve inch B.C. fir or hard pine. Before either the grillage or the post is placed, these parts are thoroughly pitched with tar or carbolineum on all surfaces in order to prevent rot. The foundation posts are then back-filled and truly lined to receive the sills. The sills, in general, are twelve by twelve inch and of spruce or hemlock, or, in cases where the spans are excessive, B.C. fir is used. In our standard ward buildings, while it is not constructionally economical, the sills run in the direction of the short dimension of the building. This is done in order to accommodate the interior structure of the wards which are forty feet wide and of a length depending upon the number of beds to be accommodated. Since a forty foot width will accommodate four rows of beds more economically than any other arrangement, this easily offsets the economical arrangement of sills and supporting beams. If, however, it was generally possible to obtain floor joists twenty feet long, this would not be necessary, as then the sills could run in the longitudinal direction of the building.

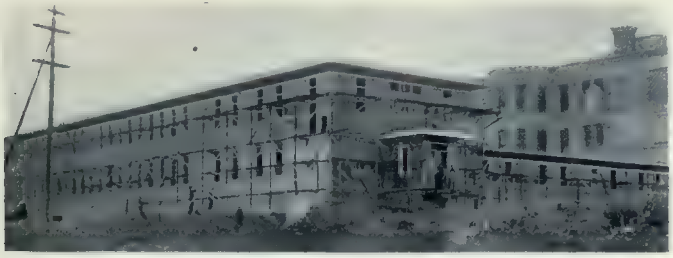


THIS IS A TYPICAL WALL SUCH AS DESCRIBED BY MR. BOWER.

As above described, the sills are placed upon the post and securely drift-spiked thereto and knee-braced. In the foundation in the forty foot width, we usually use five posts in one bay of forty feet. Down the entire sides of the central line of the building are then placed three rows of eight by eight inch posts capped either with wooden corbels or cast iron caps. These corbels or caps are found necessary in order to decrease the span between posts. To these caps or corbels are then applied the twelve by twelve inch beams to support the floor joists of the second floor. This arrangement is followed out in a similar manner for the framing of the ceiling and roof support for the second floor.

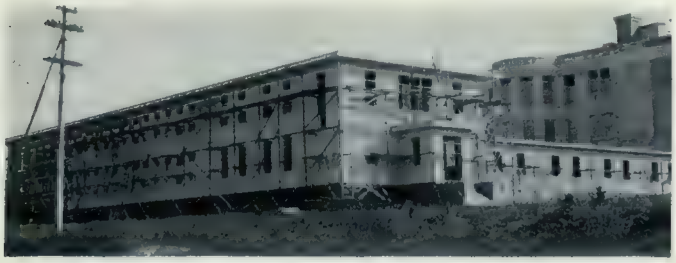
The bays across the forty foot dimension are placed in most cases twelve feet apart, and this accommodates the stock size of floor joist which is usually two by twelve feet long. The spans of all floor joists are braced with two by four inch herringbone bridging. To the floor joist is then applied one ply of rough boarding, laid in the diagonal direction. This forms a very definite brace against all deformation which is liable to occur from excessive wind pressure. The whole of the exterior of the interior of the walls, is also boarded with T. & G. seven-eighth inch sheeting placed in the diagonal direction. This also forms effective wind bracing.

The finished walls of the interior of the building usually consist of a patent boarding, the merits of which are the ease and rapidity of application together with the desirable decorative possibilities and sanitary finish. Those which have been mostly used are gypsofiber board, linabestos board, and in some instances, beaver board. To the exterior sheeting of the building is applied one ply of heavy builders' paper which is, in turn, strapped with one-half by two inch furring, to which is then directly applied wire laths. The whole is then plastered with two coats of cement stucco. In some of our more temporary buildings, Bishopric lath board and gypsofiber board, have been substituted for the wire lathing. In such cases, where the above materials have been substituted for wire lathing, the skirting below the water table has been composed of vertical sheeting.



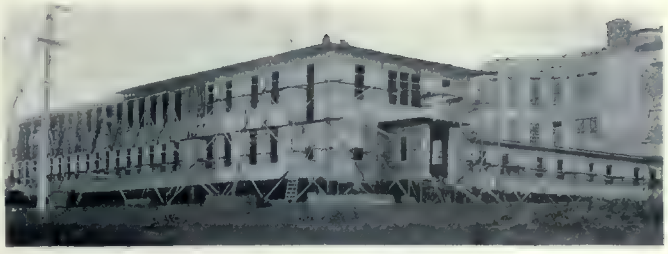
JULY 4—EAST WING WITH ROOF COMPLETED.

The flooring of the building is composed of, as heretofore stated, one ply of rough boarding. To this is then applied one ply of No. 1 maple, placed upon one ply of heavy builders' paper.



JULY 18—STUCCO WORK ALMOST COMPLETED.

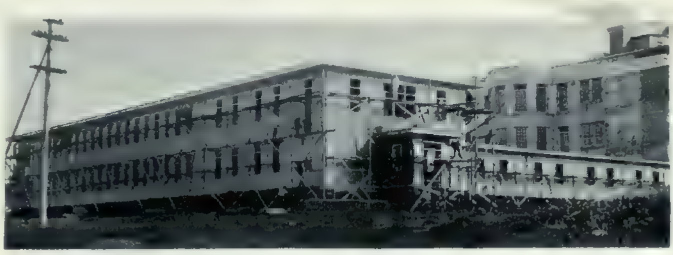
The tops of ceiling joists are always rough boarded in order to better insulate the air space between joists and roof against heat and cold. The whole of the roof rafters are covered with one ply of seven-eighths inch T. & G. boarding. To this is then applied a good three ply ready roofing.



JUNE 28—EAST WING OF GUELPH M. C. HOSPITAL.

Only one convalescent home has been erected with a view to permanency. This was Camp Hill Convalescent Hospital, Halifax. In this instance the foundation consisted of a sixteen inch concrete wall in the entire building, and concrete foundation piers were substituted for wooden posts. From this up, the sill and post construction was still used. The interior of this building was boarded with T. & G. boarding, counter lathed and plastered on the inside with paper underneath counter laths, and the exterior was wire lathed and plastered. With a view to the semi-permanency of these buildings the foundations were left one brick wide outside of the main walls in order that the buildings could at any time be veneered with brick.

Some buildings which we now contemplate to be permanent will be constructed of concrete foundations, steel beams, wooden floor joists, steel columns, hollow tile walls with either stucco or brick veneer finish and plastered with two coat work on the inside. All buildings proposed to be permanent or semi-permanent are roofed with at least a three ply Barrett specification tar and gravel roof.



JULY 11—EXTERIOR CARPENTRY WORK NEARLY DONE.

The foregoing will give a general idea of the M.H.C. constructional methods, all confusing details having been omitted.

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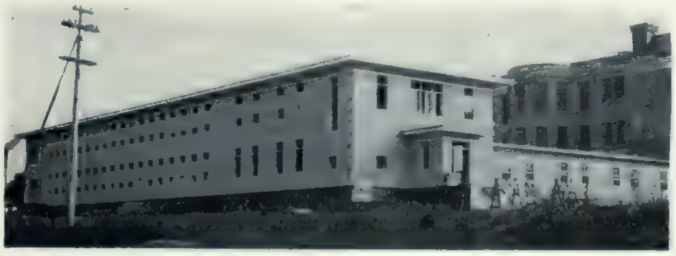
A text book on warm air heating has been issued by the National Warm Air Heating and Ventilating Association, Columbia Building, Columbus, Ohio. It describes rules for installations, covering the questions of pipe diameters, register sizes, risers, wall pipe and fittings,



JULY 25—EXTERIOR COMPLETED AND SCAFFOLDING DOWN.

SPEED OF CONSTRUCTION ILLUSTRATED.—On this page are five views showing the result of four weeks' work on the east wing of the Guelph Military Convalescent Hospital, demonstrating the speed with which the contractors, Peter Lyall & Sons, were able to carry out this work as planned by the architect for the Military Hospitals Commission.

It is all the more creditable when it is realized that coincident with this work, a west wing, similar in size and design, was being erected with equal speed.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

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CONTRIBUTIONS.—The Editor will be glad to consider contributions dealing with matters of general interest to the readers of this Journal. When payment is desired, this fact should be stated. We are always glad to receive the loan of photographs and plans of interesting Canadian work. The originals will be carefully preserved and returned.

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WESTON WRIGLEY - Editorial and Business Manager

Vol. X Toronto, September, 1917 No. 9

Royal Architectural Institute Convention

Every Canadian architect who can arrange to do so should attend the tenth annual convention of the Royal Architectural Institute of Canada, to be held at Ottawa on October 1 and 2 next.

The programme for the convention will include matters of interest to all architects, and the invitation to attend is given to every one in the Canadian profession by Mr. Alcide Chausse, honorary secretary, Montreal.

Ottawa is always an interesting city to visit, and in view of the reconstruction of the Parliament Buildings has particular interest at this time.

◆

Sudden Death of Ottawa Architect

Mr. J. W. H. Watts, R.C.A. and F.R.A.I.S., one of Ottawa's well known architects, passed away very suddenly on Sunday, August 26, in the sixty-fifth year of his age. About three months ago he had an attack of heart trouble, but rallied and was in fairly good health till half an hour before his death.

Mr. Watts was born in England, where he studied his profession, removing to Ottawa about forty years ago. At one time he was head architect under Chief Architect Thomas Fuller, of the Public Works Department.

Mr. Watts was honorary treasurer of the Royal Architectural Institute of Canada since its foundation ten years ago.

Legitimate Claim For Extras

War conditions have been responsible for a heavy increase in the cost of construction work, an example of this being the recently completed Bloor street viaduct at Toronto, the cost of erection being about $2,500,000.

The contract was signed on December 24, 1914, at a time when thousands of workmen were out of employment, and relief works were being undertaken to provide employment. Wages and material were at a low standard, and the tenders were based on these conditions.

The work was to be completed in three years, but the contractors finished the work several months in advance of the contract time.

Owing to the higher cost of labor and material, the imposition of war taxes, etc., the contractors have lost large sums on their contracts, and the question has been raised of the claim they have on the city for an extra allowance covering this sum.

The same subject has arisen in connection with the work undertaken by the contractors for the new subway in New York City, and legislation is now being considered by the New York State Legislature enabling the payment of supplementary amounts covering losses incurred owing to unforseen causes, such as the in-

THE LATE MR. J. W. H. WATTS, OTTAWA, HON. TREASURER, ROYAL ARCHITECTURAL INSTITUTE OF CANADA FOR THE PAST TEN YEARS.

creased cost of labor and material, due to war conditions.

The causes for the higher construction cost of the Bloor street viaduct are easily understood, and the allowance by the city of Toronto of the claim for a supplementary payment, covering the advances in labor and material, would be justified by all who realize the changed conditions existing to-day from those prevailing in Canada during the months immediately following the entry of Canada into the world war.

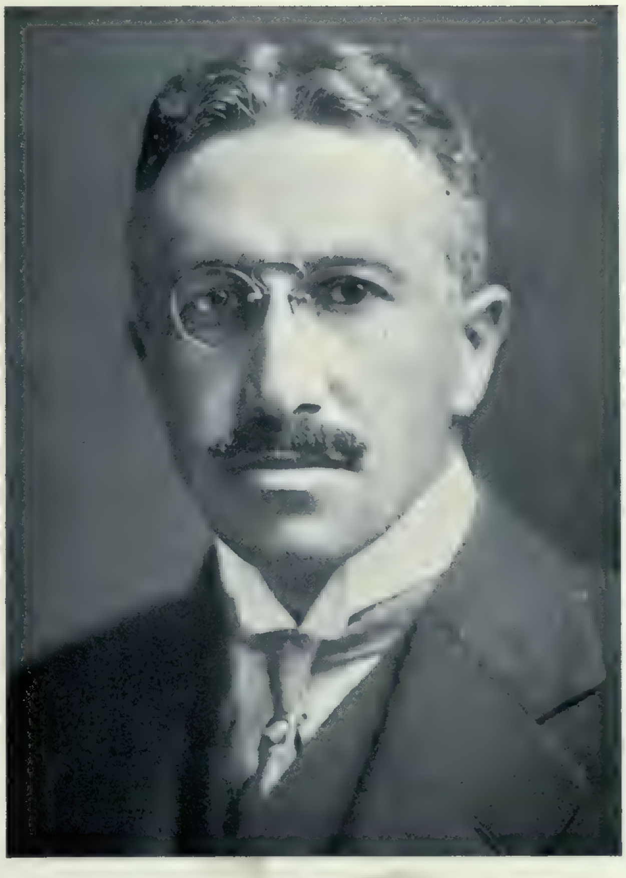
◆

Canada's Military Hospital Problem

Construction devotes the whole of this issue to a description of the work accomplished by the works branch of the Military Hospitals Commission of Canada, this being of particular interest to readers of this paper, because of the architectural and structural problems met and solved, and also because the construction of hospitals is one of the most active branches of building work in Canada to-day.

When the call came for Canada to supply accommodation for her wounded soldiers from overseas the problem was met by the appointment of a number of public-spirited citizens to act as a commission to supervise this work, and they were fortunate in being able to secure as director the services of Mr. S. A. Armstrong, who had been in charge of the construction of the Ontario Hospital for the Insane at Whitby and the Ontario Reformatory at Guelph. Equally fortunate was the selection of Capt. W. L. Symons, formerly of Symons & Rae, Toronto, as architect for the commission.

CAPT. W. L. SYMONS, C.E., OFFICER IN CHARGE OF WORKS, MILITARY HOSPITALS COMMISSION.
Formerly of Symons & Rae, Architects, Toronto.



MR. S. A. ARMSTRONG, DIRECTOR MILITARY HOSPITALS COMMISSION.
Formerly Assistant Provincial Secretary of Ontario, in which capacity the organization and construction of the large institutions at Whitby and Guelph came under his direction.

The immediate need for hospital accommodation made it necessary to secure a number of colleges, and similar buildings, and remodel them to provide quick accommodation, but as soon as these had been provided for, the architect and his staff devoted every energy to preparing plans for properly designed hospitals on suitable sites scattered throughout the Dominion. How well this has been done, and in such a brief period of time, will be appreciated by those who review the progress of the commission's building activities since last New Year's, as outlined in the reading pages, and study the plans shown for the proposed six hundred-bed Military Convalescent Home, and the equally large Tuberculosis Sanatorium, the construction of which, it is expected, will begin during the coming month.

The problems confronting the staff of the Military Hospitals Commission have been complex, but they have been met one by one, and accommodation has been provided for all of the wounded forwarded to Canada for convalescence. The erection of large hospital units, and the completion of plans for vocational and reconstructive work, are the matters engaging immediate attention, and in future issues the execution of these plans will be reviewed in these pages.

Canadian Building and Construction News

New Structures to be Erected—Contracts Awarded for Large Works—Trade Literature Issued—Other Items of Interest

BUSINESS BUILDINGS.

London, Ont.—The Utilities Board of the Hydro Electric Company are erecting an office building to cost $100,000, and their architect, L. A. Carruthers, Bank of Toronto Building, has awarded the following contracts: General, S. Wills, 765 Talbot street; mason and concrete, John Putherlough, 1007 Wellington street; plumbing, Noble & Rich, 237 Queen's avenue; pressed brick, Inter-provincial Brick Company, Limited, Toronto.

Ottawa, Ont.—Architects Millson & Burgess, Union Bank Building, are preparing plans for an office building to be built on Sparks street, to cost $60,000.

Penetang, Ont.—J. B. Jennings, Penetang, Ont., contemplates the erection of an office building. Chas. P. Band, 95 Woodlawn avenue, Toronto, is the architect.

Welland, Ont.—The Electro Metals Company, Limited, are erecting an office building, to cost $13,000, and their architect, T. L. Nichols, Main street, has awarded the general contract to W. J. Hickey, 91 Main street east, and the plumbing contract to Chas. R. Hagan, 125 Dorothy street.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Galt, Ont.—The Iroquois Hotel Company contemplates the erection of an addition to their hotel, to cost $40,000.

Hamilton, Ont.—The Military Hospitals Commission are making alterations to the Brant House, and their architect, Captain Symons, 22 Victoria street, Ottawa, has awarded the following contracts: General contractor, Geo. Frid Co., Bank of Hamilton Building; electric wiring, Electric Supply Co., 85 James street south; plumbing, A. Rodgers, 752 King street east.

London, Ont.—The London Health Association, London, are erecting a women's pavilion to the Byron Sanitarium, to cost $10,000, and their architects, Watt & Blackwell, Bank of Toronto Building, have awarded the general contract to R. G. Wilson, 193 College street.

Petrolia, Ont.—The erection of the maternity hospital for the Charlotte Eleanor Englehart Hospital has been postponed until next spring. J. M. Moore, 418 Richmond street, London, is their architect.

Renfrew, Ont.—The Renfrew Hotel Company are excavating for an addition to their hotel to cost $30,000, and their architect, W. E. Noffke, Central Chambers, Ottawa, has awarded the general contract to M. J. O'Brien, Renfrew, Ont.

Toronto, Ont.—The Military Hospitals Commission contemplates the erection of a tubercular hospital near Toronto.

SCHOOLS, ETC.

Brampton, Ont.—The Brampton High School Board are erecting a High School to cost $50,000, and their architects, Wickson & Gregg, Kent Building, Toronto, have awarded the general contract to M. C. Sackrider, Brampton.

Ottawa, Ont.—The Blessed Sacrament Church is erecting a presbytery to cost $10,000, and their architects, Millson & Burgess, Union Bank Building, have awarded the following contracts: mason, Jas. Moore, Springfield avenue; carpenter, J. Meagher, 87 Hinton avenue; heating and plumbing, W. G. Edge, Booth Building; sheet metal and roofing, McFarlane-Douglas Co., Ltd., 250 Slater street; painting and glazing, Geo. Higman & Sons, 176 Rideau street; plastering, McLaughlin & Co., 649 Gilmour street.

Kingston, Ont.—The Royal Military College contemplates the erection of an addition to their dormitory building.

Toronto, Ont.—The Central Presbyterian Church, Grosvenor and St. Vincent streets, contemplates the erection of a church in the Moore Park district to cost $75,000. The Beech Avenue Methodist Church are making additions and alterations to their church at the cost of $6,000, and their architect, H. J. Chown, 220 Scarboro road, has awarded the general contract to George Gayton, 56 Lyall avenue.

Windsor, Ont.—Architect A. H. McPhail, Board of Trade Building, is preparing plans for a Sunday school building for the St. Andrew's Presbyterian Church, to cost $15,000. The Board of Education of the city of Windsor contemplates the erection of a school.

CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

Pier Two, Military Hospital, Halifax.

Fire Extinguishers, Northern Electric Company, Limited.
Flooring, Seaman, Kent & Co.
Hardware, Lawrence Hardware Co. and Stairs Son & Morrow.
Kitchen Equipment, Wrought Iron Range Co., Gurney Foundry Co., and G. F. Blakeslee & Co.
Kitchen Ranges, Hamilton Stove and Heater Company.
Paints and Varnishes, R. C. Jamieson & Co.
Plumbing Fixtures, Standard Sanitary Mfg. Co., Ltd.
Wallboard, Beaver Board Company.
General Contractor, Brookfields, Limited.

Camp Hill Military Hospital, Halifax.

Boilers, Jenckes Machine Co., Ltd., and E. Leonard & Son.
Floor Hardener, Master Builders' Company, Ltd.
Flooring, Rhodes Curry Co. and Seaman, Kent & Co.
Heaters, Sims Tank Heater Co.
Metal Lath, Pedlar People, Ltd.
Plumbing Fixtures, Port Hope Sanitary Mfg. Co., Ltd., and James Robertson Co., Ltd.
Radiators, Gurney Foundry Co.
Roofing, Paterson Manufacturing Co. and Farquhar Bros.
Traps, C. A. Dunham Co., Ltd.
Wallboard, Sackett's and King's Plaster Board.
General Contractor, S. M. Brookfields, Ltd.

Kentville Sanitarium Military Hospital, Nova Scotia.

Doors, A. W. Allen & Son, Middleton.
Electric Fixtures, Northern Electric Co.
Fire Extinguishers, LaFrance Fire Extinguisher Co.
Flooring, Rhodes, Curry & Co.
Furniture, Nova Scotia Furnishing Co.
Hardware, W. W. Rockwell.
Kitchen Ranges, McClary Mfg. Co., and Geo. R. Prowse.
Laundry Machinery, American Laundry Machinery Co.
Mattresses, Parkhill Mfg. Co.
Paints and Varnishes, Berry Bros.
Wallboard, Beaver Board Company.
General Contractor, C. H. Wright.

St. John Armories Military Hospital, St. John, N.B.

Elevators, Otis-Fensom Elevator Co.
Heaters, Sims Tank Heater Company.
Plumbing Fixtures, Standard Sanitary Mfg. Co.
General Contractors, Drury & Sons.

Discharge Depot Military Hospital, Quebec.

Brick, Citadel Brick Co.
Electric Lighting, Quebec Electric Co.
Elevators, Otis-Fensom Elevator Co., Ltd.
Kitchen Equipment, Wrought Iron Range Co., Ltd., and Geo. R. Prowse Co., Ltd.
Paints, Martin Senour Co., Ltd.
Painting, Leonard & Sons.
Plumbing Fixtures, James Robertson Co., Ltd.
Plumbers, John Walker, Quebec.
Refrigeration Equipment, John Hillock Co.
Sterilizers, American Sterilizer Co., Ltd.
Telephone Equipment, Bell Telephone Co., Ltd.
Wallboard, Fibre Board Co., and Bishopric Wallboard Co., Ltd.
General Contractors, L. H. Peters, Ltd., Quebec.

Drummond Military Convalescent Hospital, Montreal.

Brick, Laprairie Brick Co.
Boilers, Warden King Co. and H. E. Plant Co.
Doors, R. MacFarlane & Co., Ltd.
Electric Fixtures, Northern Electric Co., Ltd.
Fire Escapes, Fred MacKay Co.
Flooring, Seaman, Kent Co., Ltd.
Glass, Pilkington Bros., Ltd.
Hardware, Jas. Walker Hardware Co., Ltd.
Inter-phones, Northern Electric Co., Ltd.
Kitchen Equipment, Gurney-Massey Co., Ltd.
Linoleum, Goodwins, Ltd.
Paints, McArthur-Irwin, Ltd.
Plumbing Fixtures, The J. L. Mott Co., Ltd., and Jas. Robertson Co., Ltd.
Plumbing and Heating Contractor, Thos. O'Connell.
Radiators, Taylor-Forbes Co., Ltd.
Screens, Major Manufacturing Co., Ltd.
Stone, John Quinlon & Co., Ltd.
Wire Lath, Pedlar People, Ltd.
General Contractors, W. M. Irving Co.

Grant Hall Military Convalescent Hospital.

Beds, Parkhill Mfg. Co.
Doors, Anglin & Co.
Electric Fixtures, Newman Electric Co.
Elevators, Otis-Fensom Elevator Co., Ltd.
Fire Extinguishers, R. S. Bickle.
Flooring, Anglin & Co.
Furniture, Knetchel Furniture Co., Ltd.
Kitchen Equipment, Gurney-Massey Co.
Kitchen Ranges, Hamilton Stove and Heater Co., Ltd.
Mattresses, Parkhill Mfg. Co.
Office Furniture, Knetchel Mfg. Co., Ltd.
Plumbing Fixtures, J. Robertson Co., Ltd.
Refrigeration Equipment, Eureka Refrigerator Co., Ltd.
Sterilizers, Ingram & Bell.
Screens, Anglin & Co.
Wallboard, Beaver Board Co., Ltd.

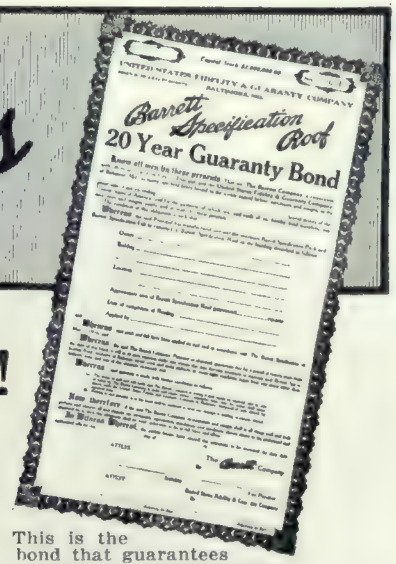
Mowat Sanatorium Military Hospital.

Beds, Parkhill Mfg. Co., Ltd.
Casements, Anglin & Co., Ltd.
Flooring, Anglin & Co., Ltd.
Furniture, Knetchel Furniture Co., Ltd.
Kitchen Equipment, Gurney-Massey Co.
Mattresses, Parkhill Mfg. Co.
Office Furniture, Knetchel Furniture Co., Ltd.
Radiators, Steel and Radiation, Ltd.
Refrigeration Equipment, Eureka Refrigerator Co.
Surgical Apparatus, Ingram & Bell.
Sterilizers, American Sterilizer Co.
X-ray Machines, Victor Electric Corporation.
General Contractors, J. M. Litton.

Whitby Amusement Hall, Military Hospital.

Brick, Provincial Government.
Flooring, Mickle, Dyment & Son.
Heaters, Ontario Reformatory, Guelph.
Structural Iron, McGregor & McIntyre.
Tile (structural), Provincial Government.
Roofing, Brantford Roofing Co.

Barrett Specification Roofs



UNITED STATES FIDELITY & GUARANTY COMPANY
BALTIMORE, MD.

Barrett Specification Roof
20 Year Guaranty Bond

Know all men by these presents

The Barrett Company

This is the
bond that guarantees
your roof for twenty years.

Twenty Years' Service Guaranteed!

It is not an unusual occurrence to go into an enterprising Canadian city and find that most of the important buildings are covered with Barrett Specification Roofs.

And the popularity of Barrett Specification Roofs is not to be wondered at when you consider the following features:

First: Lowest unit cost per year of service.

Second: Freedom from maintenance expense.

Third: Take the base rate of fire insurance.

Fourth: And most important, we now guarantee these roofs for twenty years under the following conditions:

How to Secure the 20-Year Guaranty Bond

We are now prepared to give a 20-Year Surety Bond on every Barrett Specification Roof of fifty squares and over in all towns of 25,000 population and more, and in smaller places where our Inspection Service is available.

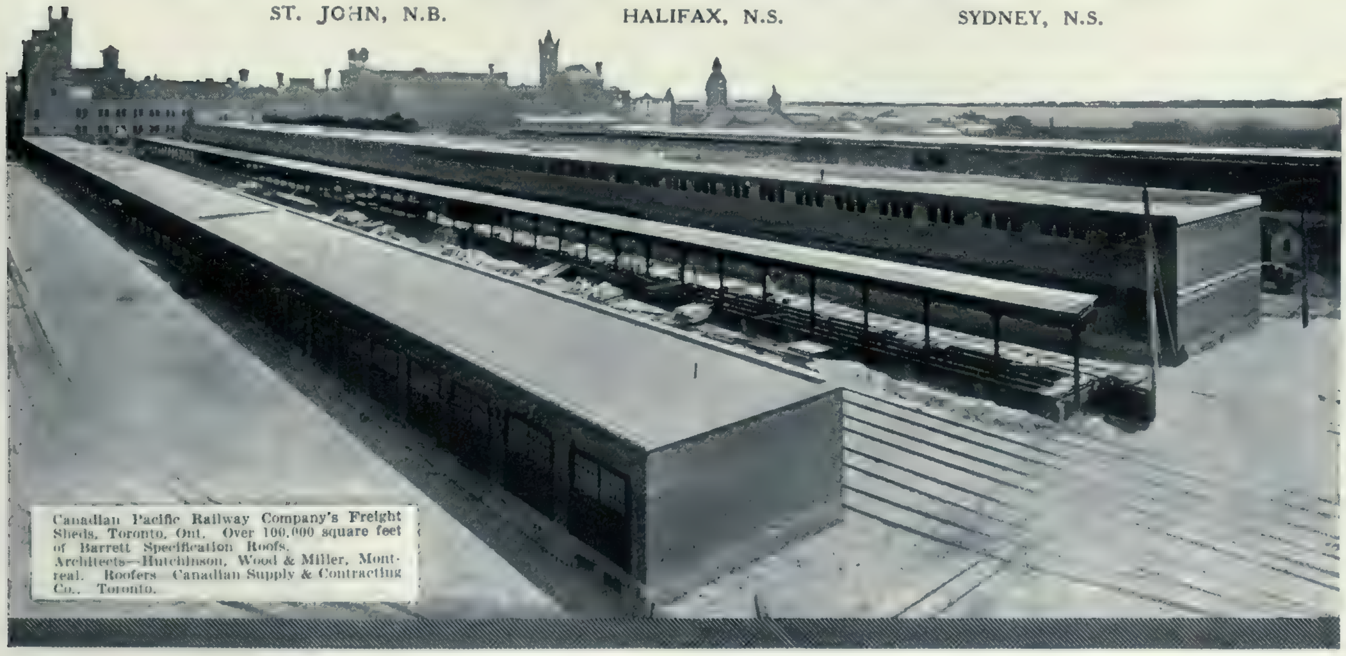
This Surety Bond will be issued by one of the foremost surety companies in America and will be furnished by us without charge.

Our only requirements are that the roofing contractor shall be approved by us and that The Barrett Specification, dated May 1, 1916, shall be strictly followed.

Further information and copies of The Barrett 20-Year Specification, with diagrams, free on request.

THE PATERSON MANUFACTURING COMPANY, LIMITED
MONTREAL TORONTO WINNIPEG VANCOUVER

THE CARRITTE-PATERSON MANUFACTURING CO., LIMITED
ST. JOHN, N.B. HALIFAX, N.S. SYDNEY, N.S.



Canadian Pacific Railway Company's Freight Sheds, Toronto, Ont. Over 100,000 square feet of Barrett Specification Roofs.
Architects—Hutchinson, Wood & Miller, Montreal. Roofers Canadian Supply & Contracting Co., Toronto.

North Toronto Orthopedic Military Hospital, North Toronto.

Brick, National Brick Co.
Boilers, John Inglis Co., Ltd.
Casements, Henry Hope & Son.
Electric Fixtures, Fred Armstrong Co. and Northern Electric Co., Ltd.
Elevators, Otis-Fensom Elevator Co., Ltd.
Fire Extinguishers, Canadian H. W. Johns Manville Co., Ltd., Canadian LaFrance Fire Extinguisher Co., Ltd., Wilson & Cousens.
Flooring, Mickle, Dyment & Sons.
Hardware, Aikenhead Hardware Co.
Heaters, General Fire Extinguisher Co., Ltd.
Kitchen Equipment, Gurney Foundry, George Sparrow & Co., McClary Mfg. Co., Wrought Iron Range Co., Hamilton Stove and Heater Co.
Lockers, Henry Hope & Son.
Paints and Varnishes, Martin Senour Co., Ltd.
Plumbing Fixtures, Standard Sanitary Mfg. Co. and James Robertson Mfg. Co., Ltd.
Radiators, Dominion Radiator Co., Ltd.
Refrigerators, John Hillock & Co., Ltd.
Roofing, Bishopric Wallboard Co., Ltd.
Screens, Henry Hope & Son.
Sterilizers, Brandell Deane Co.
Sheet Metal, A. Matthews Co., Ltd.
Stone, Britnell & Son, Ltd.
Structural Iron, Baines & Peckover, Ltd.
Tile, John Lucas & Co.
Terra Cotta, National Fire Proofing Co., Ltd.
Ventilators, A. Matthews, Ltd., and A. B. Ormsby Co., Ltd.
Wallboard, Asbestos Mfg. Co.
General Contractors, P. Lyall & Sons Construction Co., Ltd.

Spadina Military Hospital, Toronto, Ontario.

Boiler, Dominion Radiator Co., Ltd.
Doors, I. B. Smith & Son.
Flooring, Laidlaw Lumber Co., Ltd.
Electric Wiring, E. A. Drury & Co.
Hardware, Aikenhead Hardware Co.
Heating, H. O. Waterman & Co.
Iron Work, Dominion Bridge Co., Ltd.
Iron Fence and Gates, Geo. B. Meadows Co., Ltd.
Metal Skylight, A. B. Ormsby Co., Ltd.
Plumbing, Bennett & Wright.
General Contractor, W. B. Charlton.

Mount Hamilton Military Hospital.

Brick, W. G. Cooper Co.
Boilers, Warden-King, Ltd.
Doors, Paterson-Tilley Co.
Electric Wiring, Canadian Electric Co.
Flooring, Seaman, Kent Co.
Hardware, Kent, Garvin Co.
Heating, H. G. Waterman & Co.
Hollow Tile, Sun Brick Co., Ltd.
Paints, Kent, Garvin & Co.
Plumbing, R. Ross & Son.
Radiators, Dominion Radiator Co., Ltd.
Roofing, Bird & Son, Ltd.
Stone Sills, Dundas Artificial Stone Co.
Structural Steel, Hamilton Bridge Co., Ltd.
Tiling, National Fire Proofing Co., Ltd.
General Contractors, W. B. Charlton.

Guelph Military Hospital, Guelph, Ontario.

Carpets and Rugs, Robert Simpson Co., Ltd.
Casements, Ontario Reformatory, Industrial Division.
Doors, Ontario Reformatory, Industrial Division.
Fire Extinguishers, Wilson & Cousins.
Flooring, Mickle, Dyment & Sons.
Hardware, Aikenhead Hardware Co.
Paints and Varnishes, Martin-Senour Co., Ltd.
Plumbing Fixtures, Port Hope Sanitary Mfg. Co.
Radiators, Taylor-Forbes Co., Ltd.
Roofing, Bishopric Wallboard Co.
Wallboard, Asbestos Mfg. Co.
General Contractors, P. Lyall & Sons Construction, Ltd.

Byron Military Reception Hospital, London, Ontario.

Brick, J. W. Cawrse.
Boilers, Spencer Heater Co., Ltd.
Doors, W. Terry & Sons.
Elevators, Otis-Fensom Elevator Co., Ltd.
Flooring, Seaman-Kent, . Ltd.
Hardware, Hobbs Hardware Co.
Inter-phones, Canadian General Electric Co., Ltd.
Kitchen Equipment, Geo. Sparrow Co., Canadian General Electric Co., Ltd.
Laundry Machinery, Canadian Laundry Machinery Co., Ltd.
Lockers, Dennis Wire and Iron Works Co., Ltd.
Ornamental Iron, Dennis Wire & Iron Works Co., Ltd.
Paints and Varnishes, Pratt & Lambert, Glidden Varnish Co., Ltd., International Varnish Co., Ltd.
Plumbing Fixtures, Imperial Products, Ltd.
Radiators, Warden-King, Ltd.
Refrigeration Equipment, Canadian Ice Machinery Co., Ltd.
Structural Iron, C. & E. Nobbs.
Surgical Apparatus, Scanlon-Norris Co.
Tile, Italian Marble & Tile Co., Ltd.
Ventilators, Fleming & Houghtley Co., Ltd.
X-ray Machines, Ingram & Bell.
General Contractors, Hyatt Bros.

Manitoba Military Hospital.

Beds, Alaska Bedding Co.
Brick, D. D. Woods & Sons and Winnipeg Supply Co.
Casements, G. W. Murray & Co., Turnbull & McManus.
Carpets and Rugs, T. Eaton Co.
Electric Fixtures, Winnipeg Engineering Co.
Elevators, Otis-Fensom Elevator Co., Ltd.
Flooring, Rat Portage Lumber Co.
Kitchen Equipment, Gurney Mfg. Co.
Mattresses, Alaska Bedding Co.
Paints and Varnishes, Martin-Senour Co., Ltd.
Plumbing Fixtures, Jas. Robertson Co., Ltd.
Roofing, Brantford Roofing Co.
Screens, Winnipeg Woodworking Co.
Structural Iron, Manitoba Bridge and Iron Co.
Surgical Apparatus, Chandler & Fisher.
Ventilators, MacDonald Bros.
Wallboard, Manitoba Gypsum Co.
General Contractor, Thomas Sharpe.

Moose Jaw Military Convalescent Hospital.

Brick, Whitlock-Marlatt, Ltd.
Boilers, Vulcan Iron Works.
Casements, Moose Jaw Sash and Door Mfg. Co.
Cement, Canada Cement Co., Ltd., Whitlock-Marlatt Co.
Doors, Moose Jaw Sash and Door Mfg. Co.
Electric Fixtures, Northern Electric Co., Ltd.
Elevators, Otis-Fensom Elevator Co., Ltd.
Flooring, Security Lumber Co.
Hardware, Moose Jaw Hardware Co.
Kitchen Equipment, Gurney Northwest Foundry Co.
Linoleum, Dominion Oilcloth Co.
Paints, Martin-Senour Co., Ltd.
Plumbing Fixtures, Port Hope Sanitary Mfg. Co.
Radiators, Gurney Foundry Co., Ltd.
Roofing Paint, Paterson Mfg. Co., Ltd.
Refrigeration Equipment, H. E. Forbes.
Roofing, Bird & Son, Ltd.
Varnish, Pratt & Lambert, Ltd.
Ventilators, Alexander & Baird.
Wallboard, Manitoba Gypsum Co., Ltd.
X-ray Machines, Victor Electric Co., Ltd.
General Contractor, H. E. Forbes.

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MILITARY HOSPITAL ACCOMMODATION COMPLETED AND UNDER CONSTRUCTION.

Name and Place of Institution.		Accommodation.
NOVA SCOTIA.		
Ross M.C.H.	Sydney	35
Moxham M.C.H.	Sydney	110
Clayton M.C.H.	Halifax	25
Pine Hill M.C.H.	Halifax	125
Camp Hill Hospital	Halifax	600
Pier No. 2	Halifax	550
Sanatorium	Kentville	275
NEW BRUNSWICK.		
Parks M.C.H.	St. John	35
Government House	Fredericton	200
Sanatorium	River Glade	40
Sanatorium	St. John	30
Armouries	St. John	450
Discharge Depot	St. John	100
PRINCE EDWARD ISLAND.		
Sanatorium	Dalton	50
QUEBEC.		
Savard Park M.C.H.	Quebec	150
Discharge Depot	Quebec	800
Sanatorium	Lake Edward	60
Drummond St. M.C.H.	Montreal	200
Grey Nuns M.C.H.	Montreal	300
Khaki League M.C.H.	Montreal	50
Khaki Home	Montreal	60
Laurentian Sanatorium	Ste. Agathe	50
Laurentide Inn Sanatorium	Ste. Agathe	70
ONTARIO.		
Elmhurst M.C.H.	Kingston	42
Richardson M.C.H.	Kingston	60
Queen's University	Kingston	450
Sir Sanford Fleming M.C.H.	Ottawa	90
Ontario M.C.H.	Cobourg	450
Mowat Memorial M.C.H.	Kingston	210
Spadina M.C.H.	Toronto	275
College St. M.C.H.	Toronto	170
North Toronto O.M.H.	Toronto	450
Euclid Hall M.C.H.	Toronto	40
Whitby M.C.H.	Whitby	1,500
Guelph M.C.H.	Guelph	800
Newmarket M.C.H.	Newmarket	200
Victoria M.C.H.	Hamilton	30
Dunedin M.C.H.	Hamilton	30
Mountain Sanatorium	Hamilton	170
Freeport Sanatorium	Kitchener	40
Oakhill M.C.H.	St. Catharines	25
Brant House	Hamilton	300
Central M.C.H.	London	150
Queen Alexandra Sanator'm.	Byron	110
Keefer M.C.H.	Port Arthur	25
MANITOBA.		
Deer Lodge M.C.H.	Winnipeg	48
I.O.D.E. M.C.H.	Winnipeg	75
Clearing Depot	Winnipeg	100
Manitoba M.C.H.	Winnipeg	750
Ninette Sanatorium	Winnipeg	100
SASKATCHEWAN.		
St. Chad's M.C.H.	Regina	55
Saskatoon M.C.H.	Regina	150
Moose Jaw M.C.H.	Moose Jaw	350
Earl Grey Sanatorium	Regina	60
ALBERTA.		
Red Cross M.C.H.	Ogden	200
Strathcona M.H.	Edmonton	190
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Frank Sanatorium	Frank	70
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Qualicum M.C.H.	Qualicum	120
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CONSTRUCTION

October, 1917 Vol. 10, No. 10

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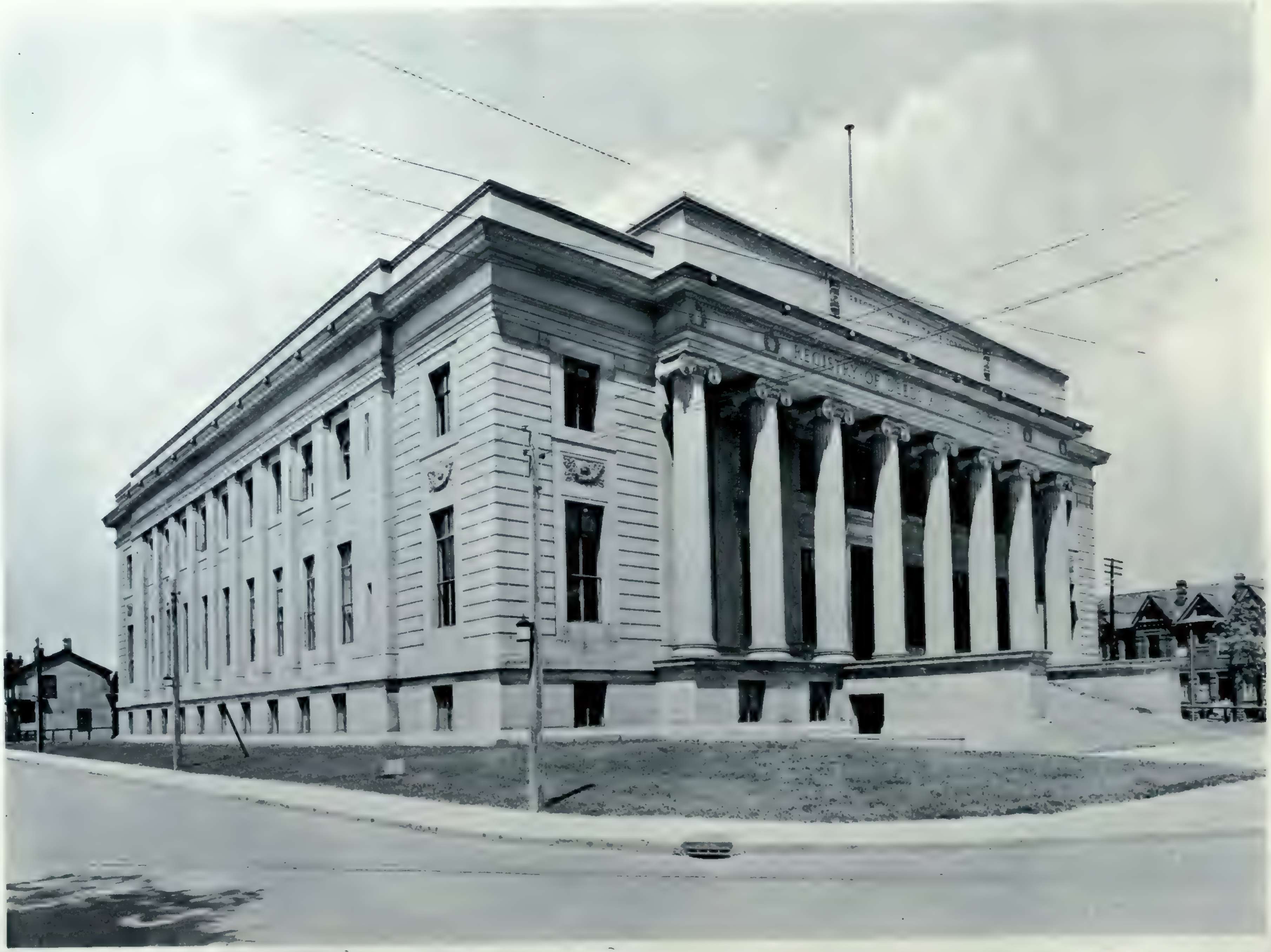


REGISTRY OFFICE, TORONTO.

CHARLES S. COBB, ARCHITECT.

The New Registry Office, Toronto

DURING the latter part of 1913 plans for the proposed Registry Office were selected by competition, in which thirty Canadian firms participated. In June, 1914, tenders were called for the construction of the building. Sixty-two firms submitted figures, including four bulk tenders. It was decided to erect the building by separate trades, and contracts were let to local firms for all parts of its construction, except the marble work, which was executed in Quebec. With this one exception it is a product of the Toronto building industry, and represents an entirely Canadian undertaking demonstrating that it is unnecessary to go to the United States for architects and contractors in order to get efficient service.

Besides being a notable addition to Toronto's public buildings, it gives vastly superior accommodations compared with the old registry offices which it replaces, providing adequate and well lighted space for both public and staff with every convenience of plan to facilitate and preserve a systematic and efficient working arrangement for filing and searching of records.

Located between Chestnut and Elizabeth streets, with its main frontage facing Albert street, it lies at a point slightly north in the district between Osgoode Hall law courts and the City Hall. As the immediate neighborhood still contains a large number of unsightly buildings comprising a section of the older part of the city, the architectural character of the new building is in marked contrast to its surroundings and its presence is bound to exert a most beneficial influence in the future development of the vicinity in which it stands.

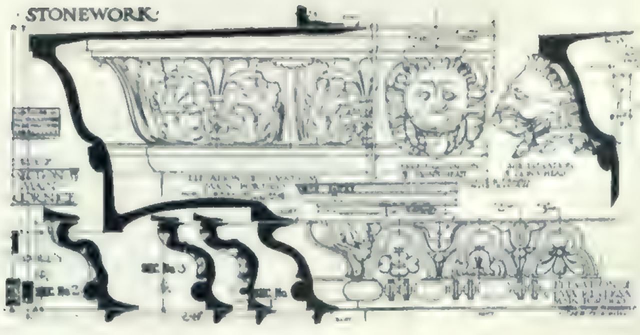
As the purpose of the building would indicate the construction is fire-proof throughout, the exterior being of buff Indiana lime stone, the frame of structural steel, fireproofed with tile and with tile arched floors and tile partitions. Sufficient excess strength was allowed in the steel frame and foundations for the addition of a future third storey.

It is interesting to note that the cost to the city exceeded by only $385.00, the lowest bulk tender submitted; the total of separate tenders amounting to $372,506.00. The cubical contents amount to 1,176,200 cubic feet, and the cost per cubic foot was 31.7c. The extra charges were kept to a very low figure, and only amounted approximately to one-tenth of one per cent. of the cost of the building.

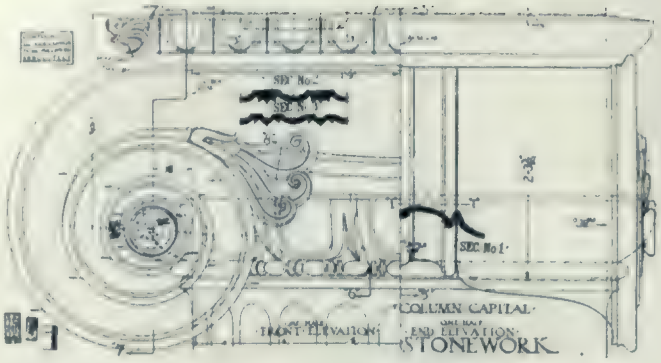
A considerable amount of marble is used in the interior, the floors being of pink and grey Tennessee; the walls in ashlar, of Champville, French marble; and the base of Bottocino. Regina marble, a Canadian product quarried at Quebec, was used for window sills, counter tops and stair treads, with most satisfactory results.

Main Floor.—The main entrance from Albert street is through a broad lobby and octagonal rotunda from which open entrances to the East and West Registry Divisions and stairs and elevator to the Land Titles section on the second floor. Duplicate offices for the Registry divisions are provided. Each of these consist of a public space, around which are grouped the coat room, waiting room, consultation room, etc., as well as the private offices of the registrar and his secretary. A large receiving space, lighted from above, is provided, with rooms for the comparing of documents, examination of originals with lift to document room on second

MAIN ENTRANCE, REGISTRY OFFICE, TORONTO.



DETAIL OF MAIN ENTRANCE, REGISTRY OFFICE, TORONTO.



DETAIL OF COLUMN CAPITAL, REGISTRY OFFICE, TORONTO.

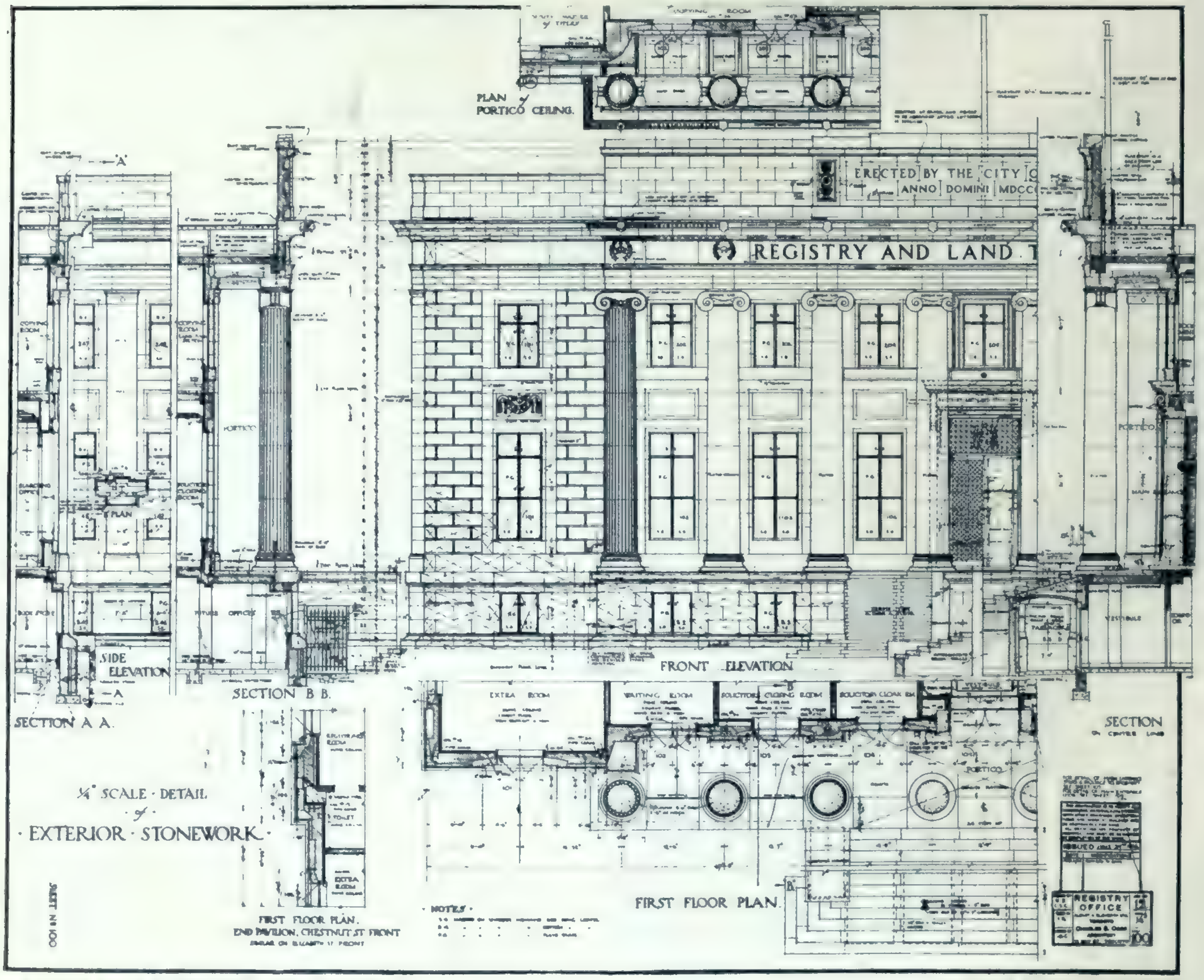
floor, and easy access to the map file room in the basement.

Opposite the receiving spaces and separated by glass partitions is the office of the Deputy Registrar, and adjacent to it is the abstracting room, which in turn is in easy access to the searching office, which occupies the entire rear of this floor of the building. The searching room, which constitutes a library of title abstracts taken from the original documents, is 53 feet by 73 feet in size, abundantly lighted from three sides. Telephone booths are here provided for easy communication of law clerks, while making searches.

A rear service hall, staff stair, and entrance with book lifts and ladies toilet room complete the accommodation of this floor.

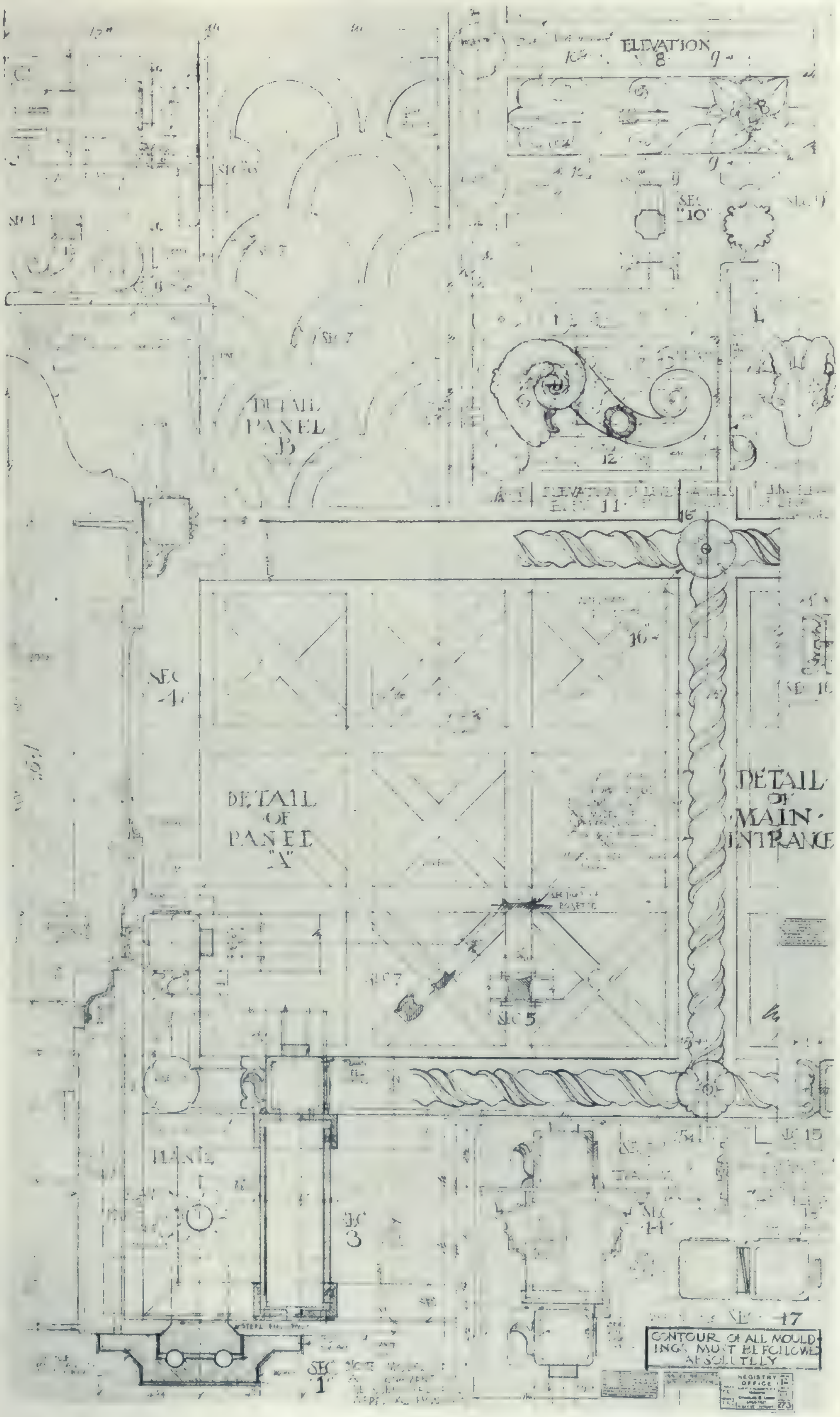
Second Floor.—On the Albert street frontage is housed the "Land Titles" section of the Registry Office. This department takes care of that part of title registry when same are guaranteed under the Torrens system. A searching office with top and side light directly accessible from the main stairs and elevator corridor is provided. Grouped around this are the document room, abstracting and comparing room, and private office suites of the Master of Titles and his deputy, lavatories, etc., for public and staff, complete the arrangement of this department.

Basement.—In the basement are storage

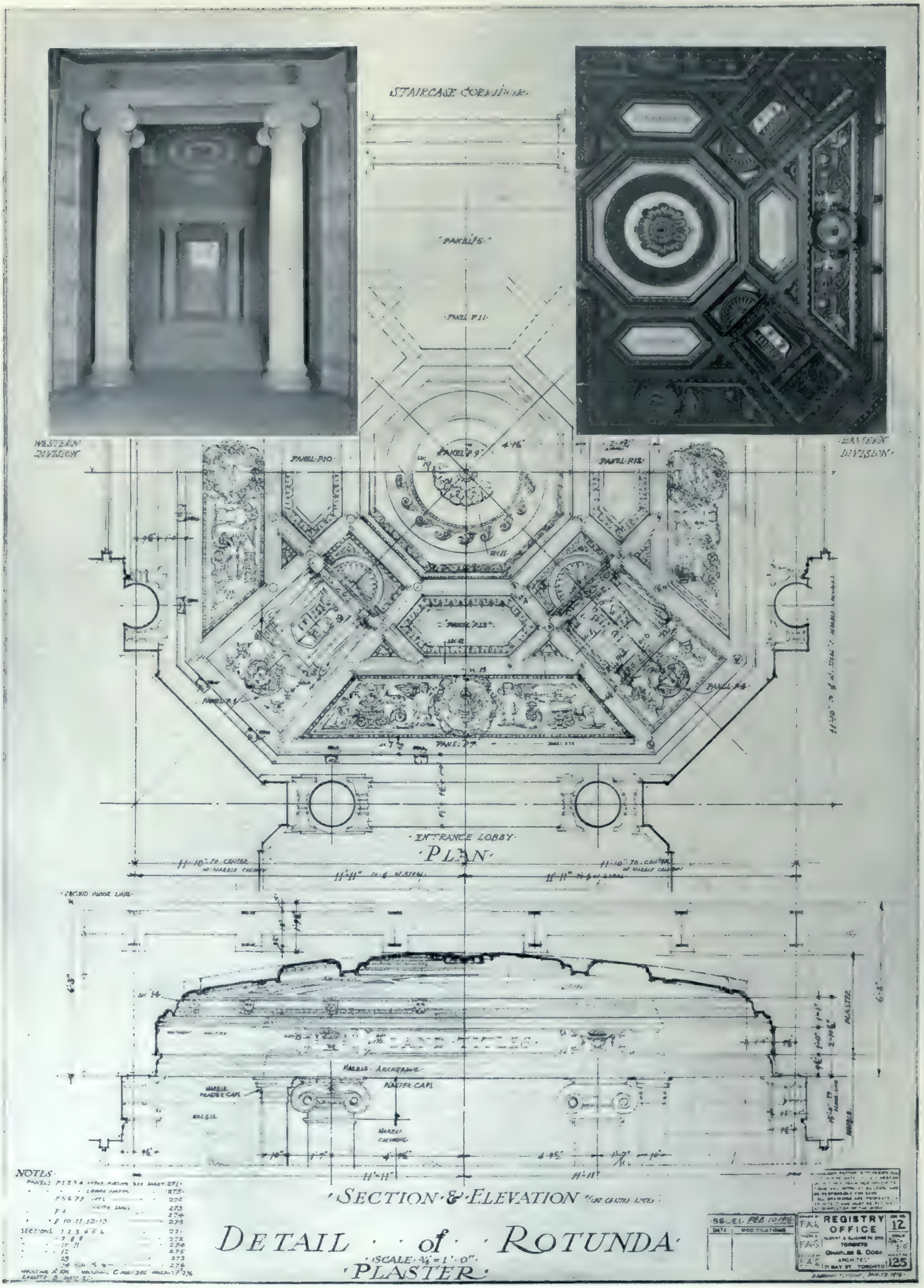


ELEVATION DETAILS, REGISTRY OFFICE, TORONTO.

CHARLES S. COBB, ARCHITECT.



DETAIL OF MAIN ENTRANCE, REGISTRY OFFICE, TORONTO. CHARLES S. COBB, ARCHITECT.



REGISTRY OFFICE, TORONTO. CHARLES S. COBB, ARCHITECT.

rooms, bindery, public and staff lavatories, map room, etc., heating and ventilating equipment as well as a suite for the resident superintendent. On Albert street frontage there is about 6,000 square feet available for use as civic offices with separate entrance from Albert street.

The heating is with steam with vacuum system and direct radiation. The generating plant consists of two horizontal return tubular boilers, each having 1,133 feet heating surface. Each boiler is equipped with a Dutch oven type smokeless furnace, consuming smokelessly the lowest grade of bituminous slack coal. Boiler feed pumps, tank, vacuum pumps, etc., are located behind the boiler equipment. The hot water for lavatories is supplied in winter by steam coil from boilers and in summer by separate jacket heater. Automatic temperature control is provided throughout the building.

The ventilation equipment of the building consists of a 61 in. by 26 in. fan, with electric drive and a 9 ft. by 9 ft. standard air washer with tempering and reheating coils. Fresh warmed and humidified air is supplied to all of the principal rooms and is exhausted to roof by gravity through ducts. A special exhaust fan for all toilet rooms is provided on the roof. The plumbing throughout is of the highest class, porcelain fixtures being used. All lavatories have self closing basin cocks.

The elevator equipment consists of one passenger elevator, two hydraulic document lifts, and two hydraulic book lifts. A vacuum cleaning equipment is also supplied.

Since its occupancy the building seems to fulfill the requirements demanded of it in every particular and although erected during the period of the war, and while not pushed by the owners, was completed practically within contract time.

◆

THE MECHANICAL EQUIPMENT

Melvern F. Thomas, Consulting Engineer

The new Registry Office building is heated by a vacuum steam system of direct radiation, which is supplied with steam from two 66-inch diameter by 16 feet horizontal tubular boilers. These boilers are equipped with the Dutch Oven type smokeless furnaces, using the lowest grade of bituminous coal without producing smoke.

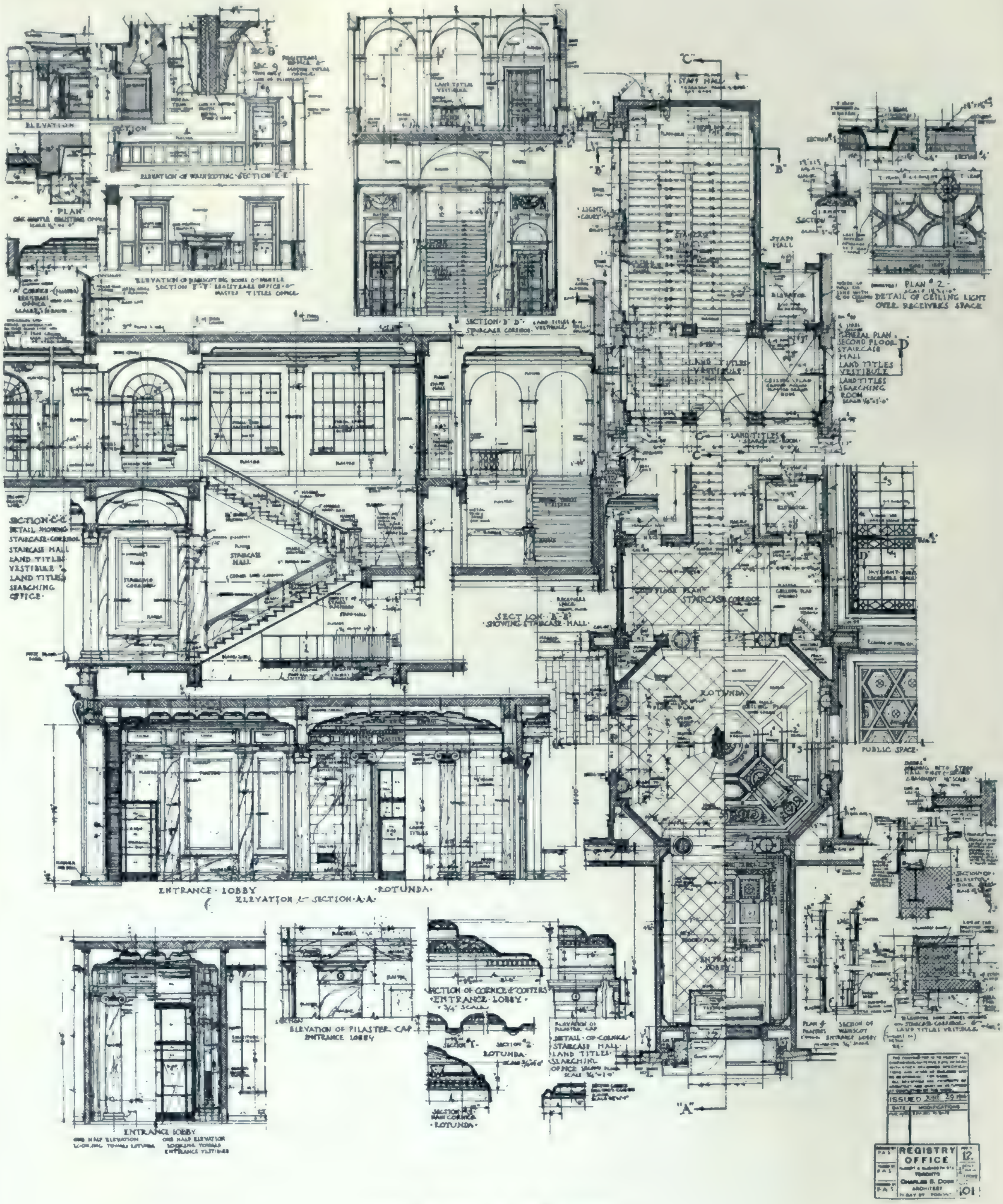
PUBLIC SPACE, REGISTRY DIVISION, REGISTRY OFFICE, TORONTO.

Steam is distributed to the direct and fan-blast radiation by a system of piping located on the ceiling of the basement in the rear portion of the building and concealed in trenches under the basement floor in the important front rooms of the basement. Each radiator is equipped with a thermostatic vacuum trap and the entire system is arranged to be operated with vacuum pumps or by gravity. There is a complete system of auxiliary equipment, including an automatic damper regulator, two boiler feed pumps, two vacuum pumps and the necessary receiving tanks for automatic controlling equipment.

The heating of the entire building is under automatic temperature control. Each room is equipped with one or more thermostats which control the steam supply to the radiators in the room.

There is installed in the building 7,579 square feet of direct radiation and 3,051 square feet of cast iron fan-blast heating surface, all of which is controlled by 59 vapor disc type thermostats and 106 diaphragm steam valves.

Ventilation.—The most important rooms of the building are ventilated by a supply of fresh air which is tempered, washed and reheated and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SECTION C-C DETAIL SHOWING STAIRCASE CORRIDOR STAIRCASE HALL LAND TITLES VESTIBULE LAND TITLES SEARCHING OFFICE
STAIRCASE HALL
SECTION B-B SHOWING STAIRCASE HALL
STAIRCASE CORRIDOR
ROTUNDA
PUBLIC SPACE
ENTRANCE LOBBY
ENTRANCE · LOBBY · ELEVATION & SECTION · A · A · ROTUNDA
SECTION OF CORNICE & COFFERS ENTRANCE LOBBY
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SECTION 1 · SECTION 2 ROTUNDA
DETAIL OF CORNICE STAIRCASE HALL LAND TITLES SEARCHING OFFICE
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CHARLES S. COBB ARCHITECT
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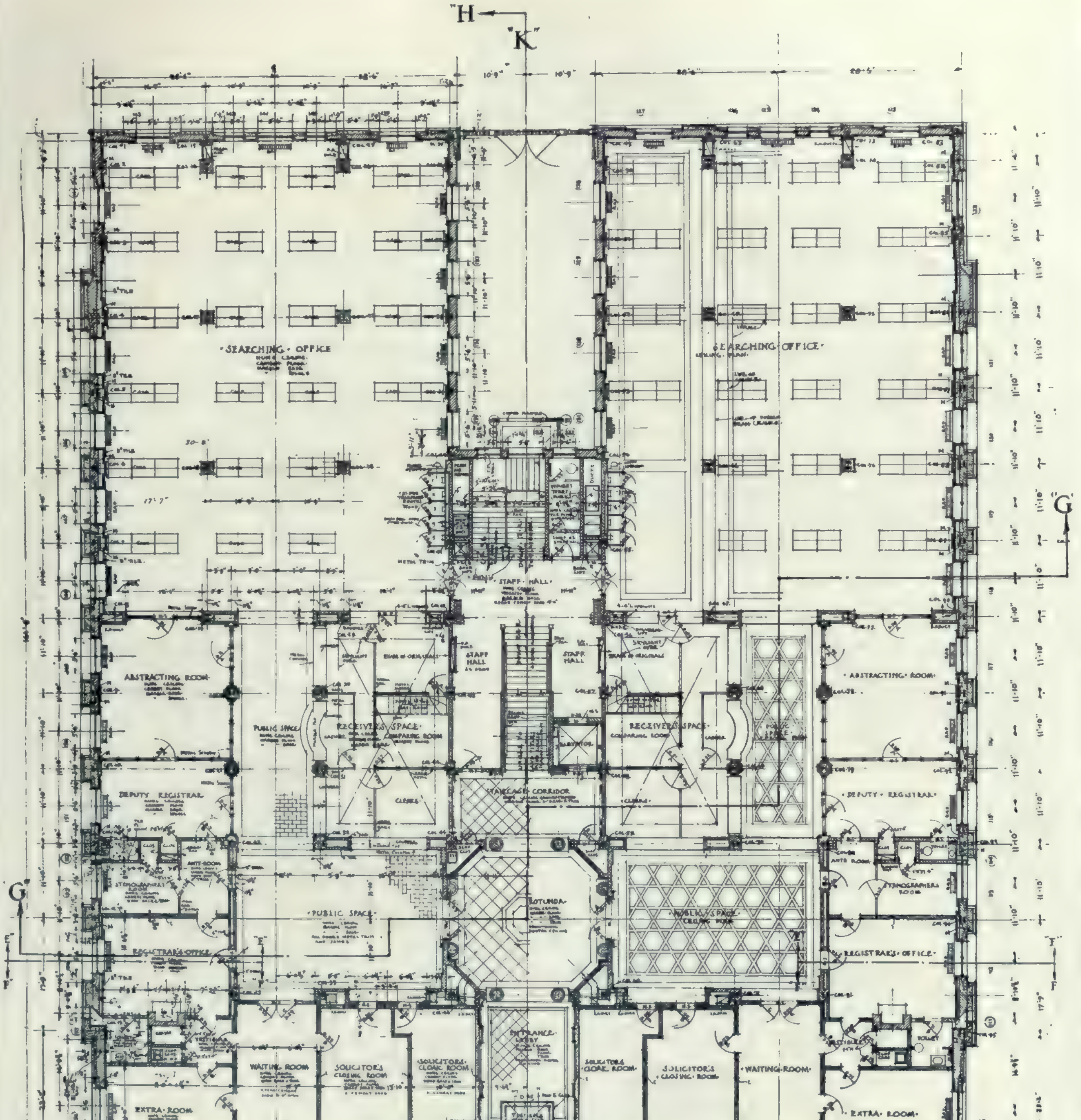
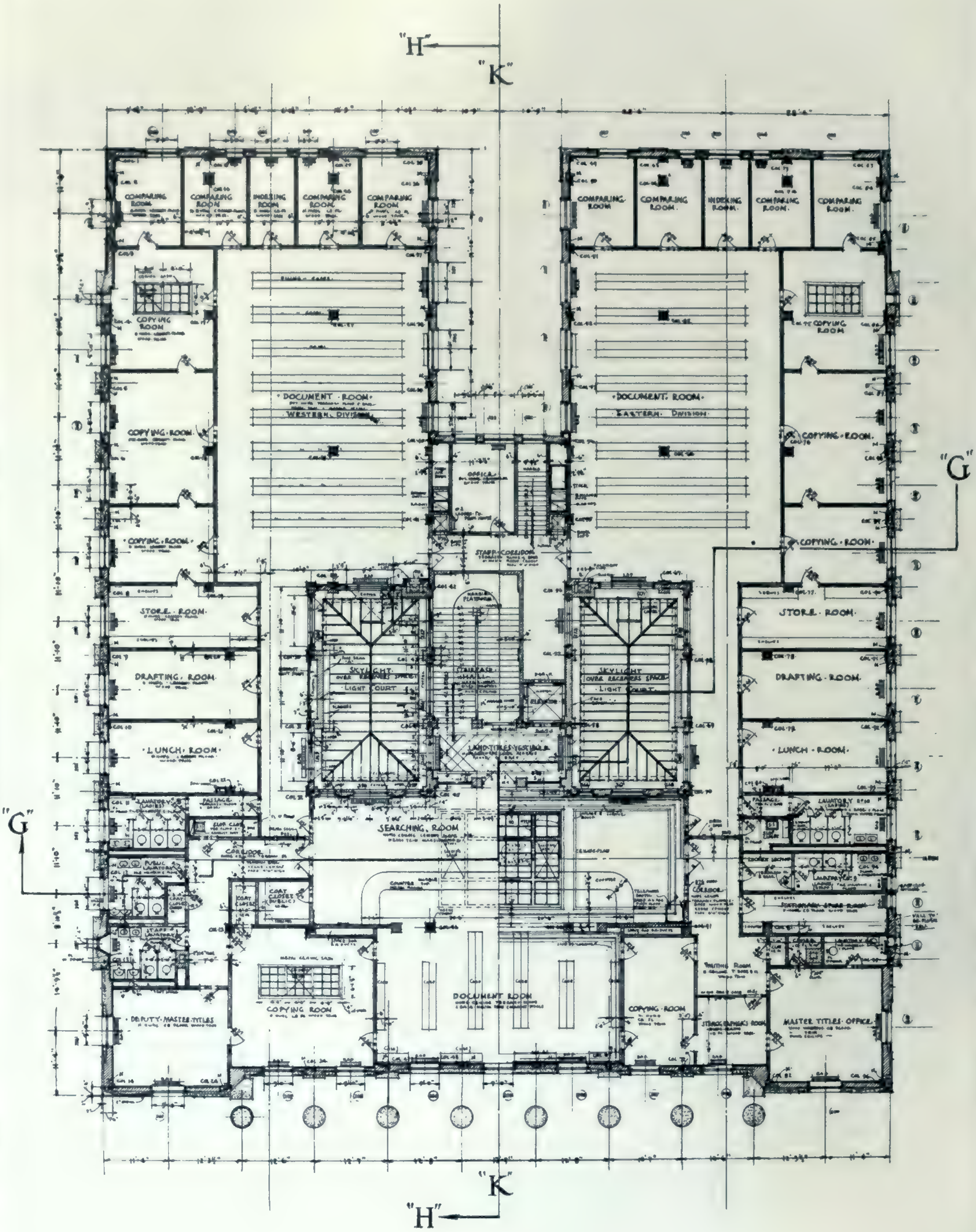
DETAILS, REGISTRY OFFICE, TORONTO.
CHARLES S. COBB, ARCHITECT.

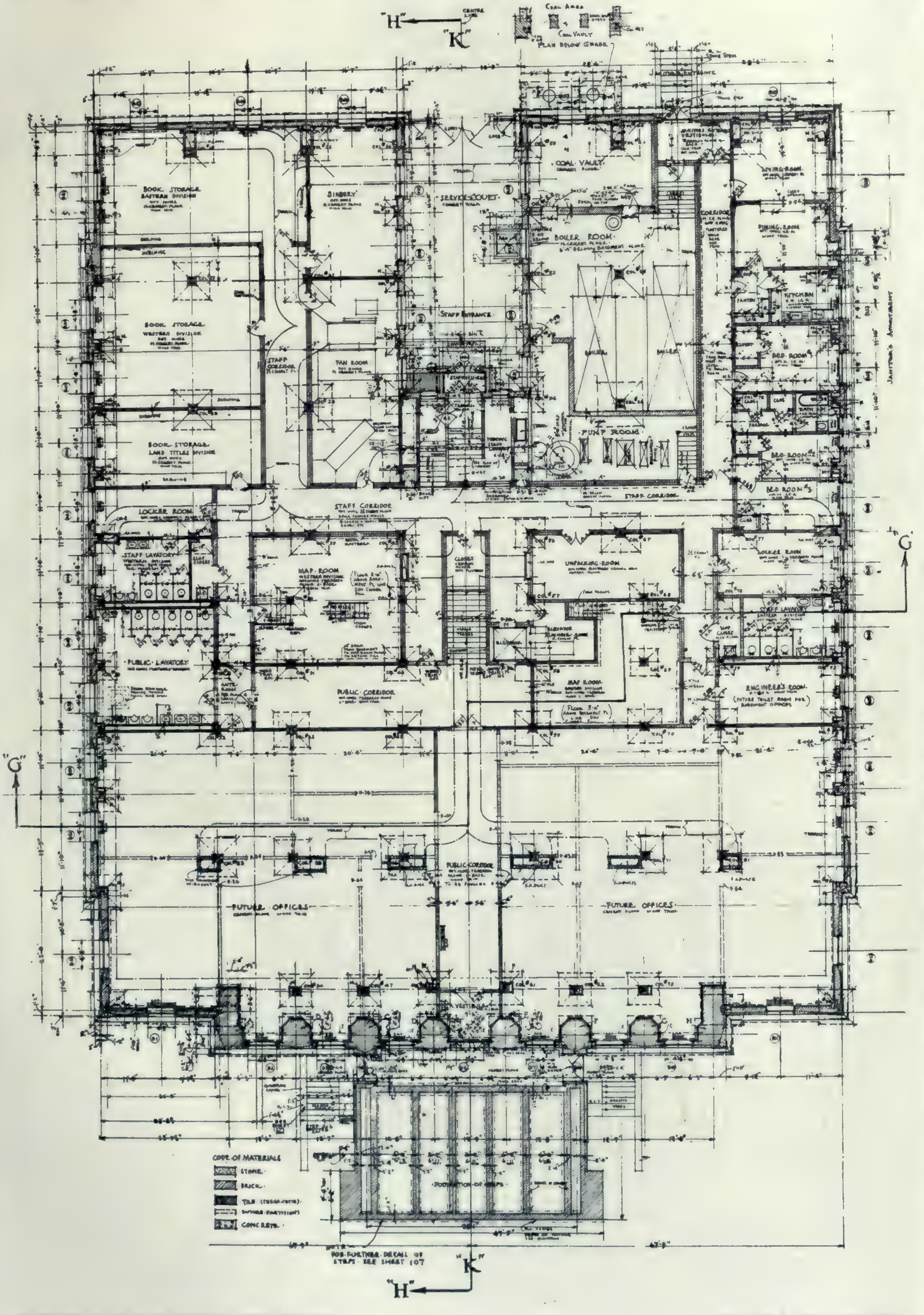


GROUND FLOOR PLAN, REGISTRY OFFICE, TORONTO.

CHARLES S. COBB, ARCHITECT.



SECOND FLOOR PLAN, REGISTRY OFFICE, TORONTO. CHARLES S. COBB, ARCHITECT.



BASEMENT FLOOR PLAN, REGISTRY OFFICE TORONTO. CHARLES S. COBB, ARCHITECT.

SEARCHING OFFICE, LAND TITLE SECTION, REGISTRY OFFICE, TORONTO.

forced into the rooms by a large fan. This air is under complete temperature control, and is intended to enter the rooms at a temperature from 70 to 75 degs. F. and with a standard moisture content from 50 per cent. to 60 per cent. of saturation. The control of the moisture is obtained by controlling the temperature of the air leaving the air washer. Of course this humidity control is not effective when the amount of moisture in the outside air is greater than that necessary to give a saturation of 50 per cent. to 60 per cent. after the air is warmed to a temperature of 70 degrees.

An exhaust fan is installed in the attic and is connected by a system of galvanized iron air ducts to all the lavatories. This fan has an extra large capacity and gives very thorough ventilation by exhausting the air from these rooms.

Coal and ashes are handled by an overhead trolley system which enables the firemen to transfer coal directly from the bin to the hoppers over the furnaces and to transfer cans of ashes from the space in front of the boilers to the hydraulic lift which elevates them to the street level.

A stationary vacuum cleaner is installed in the pump room and connected by iron pipes to outlets located throughout the building so that all rooms are accessible to the vacuum cleaner hose.

Plumbing.—The entire building is equipped with a modern system of plumbing and drainage. All piping in connection with this work above the basement floor is extra heavy galvanized iron, cast iron piping is used below the basement floor. There are sixteen lavatories, equipped with 79 high grade vitreous china and porcelain fixtures. All lavatories are supplied with hot water from a storage tank located in the boiler room.

Electric Service.—The ventilating fans, vacuum cleaner, sump pump and elevator are all operated by 230 volt, direct current electric motors, and the entire building is wired with a complete conduit system for illuminating purposes. There is also installed a secondary system of conduits for telephone and call-bell wiring. The electric service for lighting is 3-wire 115-230 volt, 25 cycle alternating current. The original plan shows 74 electric circuits under the control of 255 push button switches and serving 385 lighting outlets.

SEARCHING OFFICE, REGISTRY DIVISION, REGISTRY OFFICE, TORONTO.

Professional Ethics

By W. A. Langton.

(Paper read before the Royal Architectural Institute of Canada.)

WHEN I spoke to a leading architect of Toronto on the subject of this paper, he said: "All a man has to do is to behave like a gentleman."

That is true, but an understanding of circumstances is required as well. The instinct for right conduct is the better fitted for action by considering in advance the types of judgment it may be required to make.

A right understanding of the principles that should regulate the behaviour of those who practice a profession is involved in a right understanding of the nature of a profession. In considering that we shall, at the same time, be able to consider the snares that lie in wait for the inexperienced and the thoughtless; snares manufactured, for the most part, by members of the profession, who do not understand the nature of their calling, or by the very public for whose advantage it is that the restraints of professionalism should govern the practice of architecture.

A profession, then, as distinct from ordinary labor and from most kinds of trade, has two essential peculiarities; it requires special knowledge so that those who want to obtain its results are obliged to put themselves in the hands of a trained practitioner; and the article which is for sale and purchase is the intangible, unassessable and unguaranteed measure of the practitioner's power to perform an important piece of work. There are, as it were, no goods upon the counter. This latter condition is, it is true, also the case in other callings in which the thing for sale is personal service only; but the element of importance is lacking. The stenographer and the office boy, the coachman and the cook, also offer for sale only character and ability to perform, but the results are immediate, and can be judged before any great harm is done. An architect, on the other hand, may lock up a fortune in an unprofitable building without the person principally concerned being aware of it until the work is done and its insufficiency begins to appear.

From these two essentials then—that the architect alone has the talent and training required for his work, and that his possession of these requisites is always unproved for work not yet done, we may deduce the principles that should govern him in his relation to his art, to his clients, and to other members of the profession.

The first point, then, and the principal point, in the ethics of architectural practice is that the architect should be able to do the work he undertakes to do. He must fit himself to deserve the confidence that is placed in him.

Most architects get the length of insisting that they be given the full confidence of their clients. They are always ready to exalt the architect. There are no doubt some who think that this Institute is intended to exalt the architect; to take care of his interest. It is not. This Institute and our provincial associations are intended to exalt the art and practice of architecture; to create high ideals of both in the minds of architects and so help them to better performance. These bodies are, therefore, really intended to take care of the interests of the clients of architects. There is no room for any other aim, for the practice of architecture is the service of clients. The architect must not only have no other aim which contradicts this, but he may give himself up wholeheartedly to this aim with the certainty that in it will be fulfilled all legitimate ends of his calling—art, honor, profit and good-will to men.

It may be asked, in connection with this: Is not the architect to think of his fee at all? In reply to this we must recognize that, though the carrying out of an architectural design is of so complicated a nature that the joy of performance can hardly obtain all through for the artist, as it does in simpler arts which are executed by the artist's own hand, yet it is creative work; and the result, in its development and attainment, are an end in themselves and enough to absorb the mind of a real artist, to the exclusion of thoughts of the reward. But the architect's mind, or the composite mind of a firm of architects, must include a grasp of the means of financing the expensive operation of producing good work. He must for that reason think of the cost when he undertakes the work, and must then, therefore, think of his fee. But the fact is that for nearly all kinds of services there is no occasion to think of it. The schedule of fees fixed by the associations are intended to make such thought unnecessary. They are arranged, so far as possible, to secure for all kinds of work a payment that will enable the architect to keep up the means of performing it properly.

If the provisions of the schedule prove to be insufficient, or an architect thinks he is entitled to more, he has a perfect right to fix a fee to suit his own ideas; and indeed he ought to do so. He cannot meet an insufficient fee by work to match. There is but one grade of professional work—the best; and it must be paid for. It must also be paid for by the client.

The latter condition opens up another point of proper practice. It is not conducive to the proper practice of architecture, that is to say, to the true service of the client, that the architect should receive pay from anyone but the client, or should find pecuniary profit in building for clients in any other way than by direct payment from the client. He may not, therefore, deal in building sites, in such a way that it is to his interest that a client's building should be placed on one site rather than on another. He may not be a party in the contract or have any interest in it. He may not receive payment of any kind from anyone who is concerned in the erection of the client's building, except the client himself, and, therefore, for instance, if he has made a successful invention in building material or contrivance, he had better get rid of the patent right altogether, rather than make his profit by royalties on its use. He must, in short, have payment for his work so arranged that he can give himself up to it, when it is once undertaken, without thought for anything but its perfection in the interest of his client.

Here arises another question which is often raised by architects: How far is the client to be honored in wishes which interfere with good design? This question deserves a paper to itself. The answer turns upon the question: What is good design? My own opinion is that, where the client's wishes have interfered with good design, the defect is to be referred to the designer. The problem set before the designer is the client's wishes. It is from these that he must make his design; not from his own preconceived notions embodying some architectural conception. We do not look for draughtsmen's designs from architects. Taste can take precedence of precedent. The true architect takes fire most when confronted by a problem. It is the reconciling of inconsistencies that gives life to his design. Why should we find the irregularities of old work, the freedom of good classic design, the imperfections in logic of the English Gothic so charming, and yet fear to have in our own work irregularities that have a reason and imperfections that make for comfort? It is seldom that faithful effort to combine good work with attention to the client's wishes will find that the two are really incompatible; but if it does, if the architect finds at length that he must suffer opposition, he will be able to back it with good reasons.

The architect must, however, be on his guard against falling in with the wishes of his client, when the latter wishes to do something that is not decent behaviour towards a neighbor, or in the way of evading municipal regulations. It must be remembered that at the back of his mind the owner is relying upon his architect to keep him within limits in these matters. He feels out in consultation how far he may go in considering exclusively his own interest, and will not think well of an adviser who lets him go too far. It is the architect's duty, in the first place, to see if the object the client has in view can be obtained, without encroaching on the rights of others, by further study of the plan or by original contrivance. If it is manifestly impossible to do otherwise than wrong, it becomes the architect's duty to point out to his client that in so carrying out his wishes he would be giving him bad service, and that he must decline to do so.

Even at this pinch it must be seen that quarreling with the client is not included. The architect must be reasonable or he is wrong. If the architect is reasonable he must be right; and he is most likely to meet with the respect which is his due, and the deference to his opinion which the case demands. Where a client and his architect part in mutual anger, there is room for the architect to doubt the ethical correctness of his own conduct.

In this connection it is worth noting that it is part of an architect's professional honor to keep to himself all confidences made to him by his client in the way of business. In case of a quarrel, the architect will have exceptional opportunities of behaving like a man of honor in this respect.

The question of taking part in competitions, which exercised so much the minds of a past generation of the profession, has been settled for practice by a compromise. No architect really believes that there is any real ground for the idea of the general public that the best possible design for a building is to be got by making a selection from a number of designs by different architects. One may say with certainty that the designs are not the best that can be made; for any of the same architects would produce better results if they had an opportunity of studying the problem quietly in consultation with the clients. Nor is the selection that is made at all certain to be the best selection. But, because competitions offer such a chance of a short cut to pecuniary success, there are always architects to be found who will support them. The councils of the profession have, therefore, agreed to accept, as offering some chance to be productive of good work, those competitions in which the competitors are paid for their sketches, so that they can afford to put into them a proper amount of study.

The place formerly occupied by the competition question seems to be now taken by that of advertising. It is argued that advertising is good for both the individual architect and for the profession.

One has only to read the joyous revelations of their methods, made occasionally by successful advertisers, to understand that the kind of advertising which gets results out of proportion to the value of the thing offered—the kind of advertisement which most affects the imagination of the commercial world in favor of advertising—can have no place in the ethics of architecture. Nor is the public, which as the puff advertisers say, "Likes to be deceived," in the same mood when it proposes to employ an architect.

It seems at first like fantastic severity to say that, as a matter of simple information to the public, an architect should not advertise himself and his wares as a shoemaker does. How are people to know he is in practice if he does not let them know? How is he to have confidences placed in him if he does not let them know what he is good for?

The latter question is the more easy to answer. The case is different from that of the shoemaker, who advertises a finished product which anyone can come and see for himself and try on. An architect's wares are his potential ability to perform; an ability which for every particular case is still untried. It is a true instinct, therefore, which prefers that the client should come of his own initiative to seek the services of the architect. It puts the architect in a sounder and more honorable position. The reverse process, where the architect tries to invite or entice the client is, therefore, less sound and honorable.

As for the mere card of advertisement, giving name and address, it is futile if every architect adopts it, and all are advertised in the same manner and to the same extent. If advertising is to be to the advantage of any particular advertiser, there must be some introduction of the self-assertive note or some greater extent to the publication of his card. That is to say, there must be inevitably introduced among architects a competition in advertising. Who is likely to get the greatest advantage out of that? Not the beginner, for whose sake the practice of advertising is advocated; but the large and successful practitioners who know, as part of their general experience, how and where to advertise; who have the means to advertise extensively; whose name, with advertisement, will carry weight, just as it does without it.

If there is to be this kind of competition, it is well to remember the tax it will impose upon the profession in the way of cost; a cost which must be transferred to the client; and as it is not an expenditure incurred in rendering better service, will introduce a debasing leaven to disturb the present simple relation between charges and service.

The fundamental objection, however, to competitive advertising among architects, or any kind of effort "to get work," is that the case is again different from that of the shoemaker. People do not plump the savings of a lifetime into a pair of shoes. Most people have several pairs of shoes; different kinds, also, for which they will very likely go to different makers. Thus several of the advertisers in the trade will share the custom of one purchaser. It is not so with architecture. As a rule, each building promoter feeds the profession with but one building. Any architect, therefore, who snatches at this building snatches it away from some one else. Pushing one's self in architectural practice is reaching out for work that would not naturally come to one; that is to say, it is taking away from someone else the work which would naturally come to him. This does not seem to be work for a Christian or a gentleman, and cannot, therefore, find a place in the proper ethics of architectural practice.

It is said, with regard to the question of advertising, that advertisement by individuals would help the profession generally, as the practice would tend to bring work into the hands of architects which might otherwise be performed without their assistance. If it did, the additional fee accruing to the profession as a whole would hardly equal the additional cost incurred by the profession from the practice of advertising; and it is very doubtful if the class of work brought in as a consequence of the advertising would bring, in its execution, much joy to the artist.

It is not likely that the public will ever come to look to an advertising directory for information in choosing an architect rather than read the record of his works. "*Si monumemtum quaeris circumspice*" may be said of a living architect as of the dead.

The free publicity given by his works is every architect's best advertisement, and it is for the interest of all, both the public and the profession, that it should remain so. Young architects who are apt to favor advertising had better possess their souls in patience. Experience is necessary, as well as knowledge; and instead of despising the day of small things they should welcome the small beginnings which give them an opportunity to get thoroughly on their feet in practice, in preparation for the larger work which is sure to come if they acquit themselves well in what they find to do. Their interest, as the interest of all other people, lies not in short cuts which will bring incompetence to the front, but in the stability of the process by which the best architects get the best work.

In connection with young men and their work, it is worth while to notice a question that has arisen with the advent of large commercial buildings and large building firms. The builders are said to seek the elimination of the architect, offering to be responsible for the design as well as the construction of the buildings. We know, as a matter of fact, that there is no such elimination in the case of the most important buildings of this kind; nor in similar cases are the owner's interests likely to go unguarded for the want, that is to say, of an architect employed by himself; but there must be a good deal of commercial building on a large scale done in this way. The designers, who work for the builders, must have an architectural training. Who are they? There may be some doubt among architects as to the propriety of architects being thus associated with builders. Any architect in such practice as to be in the way of employment to carry out similar work on behalf of the owner is not likely to be sought as a builder's designer, and the situation of now running with the hare and now hunting with the hounds is not likely to arise. For young men, however, graduates of the architectural schools, this is quite suitable work. They supply well what the builder wants, and will gain invaluable experience for themselves. Hack-work has always been a wholesome exercise for genius in the arts, and there have been much lower walks in hack-work in the past than these modern monumental performances in commercial building.

In conclusion, it is fitting to notice how important it is in order to practice architecture with ethical correctness, that architects should be associated, not only to discuss and elucidate questions bearing upon such practice, but to give one another the support of companionship in sustaining a standard that it is hard to uphold alone. The honorable among the dishonorable is apt to suffer loss; and if we agree in approving of the honorable practice of our profession we had better agree in practicing it thus together. This is the reason for professional associations, and it is also a reason why they should not be so wide open as to include practitioners who are unfit or unwilling to give good service to the public. Our associations should be bodies of the *elite*, and membership of them so obviously an advantage, not only from the professional standing it gives, but from the interest and value of the proceedings, that everyone who undertakes to practice architecture will find it important for him to seek membership and to devote himself to the kind of professional service that the associations exist to uphold. This refers more particularly to the voluntary association; and it is not at all certain that when there is full recognition of their necessity the effort required to make them of value will not make their influence in the production of good work in architecture greater than that of a statutory association, though less widely spread.

NEW AIR MOISTENING DEVICE

A novel scheme for securing the proper degree of moisture in connection with the use of a warm-air furnace has been proposed by a member of the engineering division of the Iowa State College.

A slot four inches long and one-half inch wide, with the long dimension horizontal, was cut near the top of the galvanized-iron furnace jacket directly over the evaporation pan. A strip of wire cloth eight inches wide and four feet long was folded lengthwise through the center. A sheet of asbestos the same size was then folded in the same way. The paper was then placed between the two layers of wire cloth and sewed in place, using a wire drawn from the edge of the cloth.

This combination strip was then slipped in the hot air chamber through the slot in the furnace casing until the lower end of the strip could be drawn into the evaporating pan near the furnace bottom. The upper end of the strip was opened for a funnel.

A connection was then made in the water pipe in the furnace roof and pet cock installed in this connection just above the the funnel in the upper end of the combination strip. Water allowed to drip into the funnel saturates the upper end of the asbestos strip. The length of the strip depends upon the rate of supplying water and temperature within the hot air chamber. In case water is supplied more rapidly than evaporated the excess collects in the evaporation pan below. As the weather moderates the amount of water supplied by moistening apparatus should be decreased or shut off.

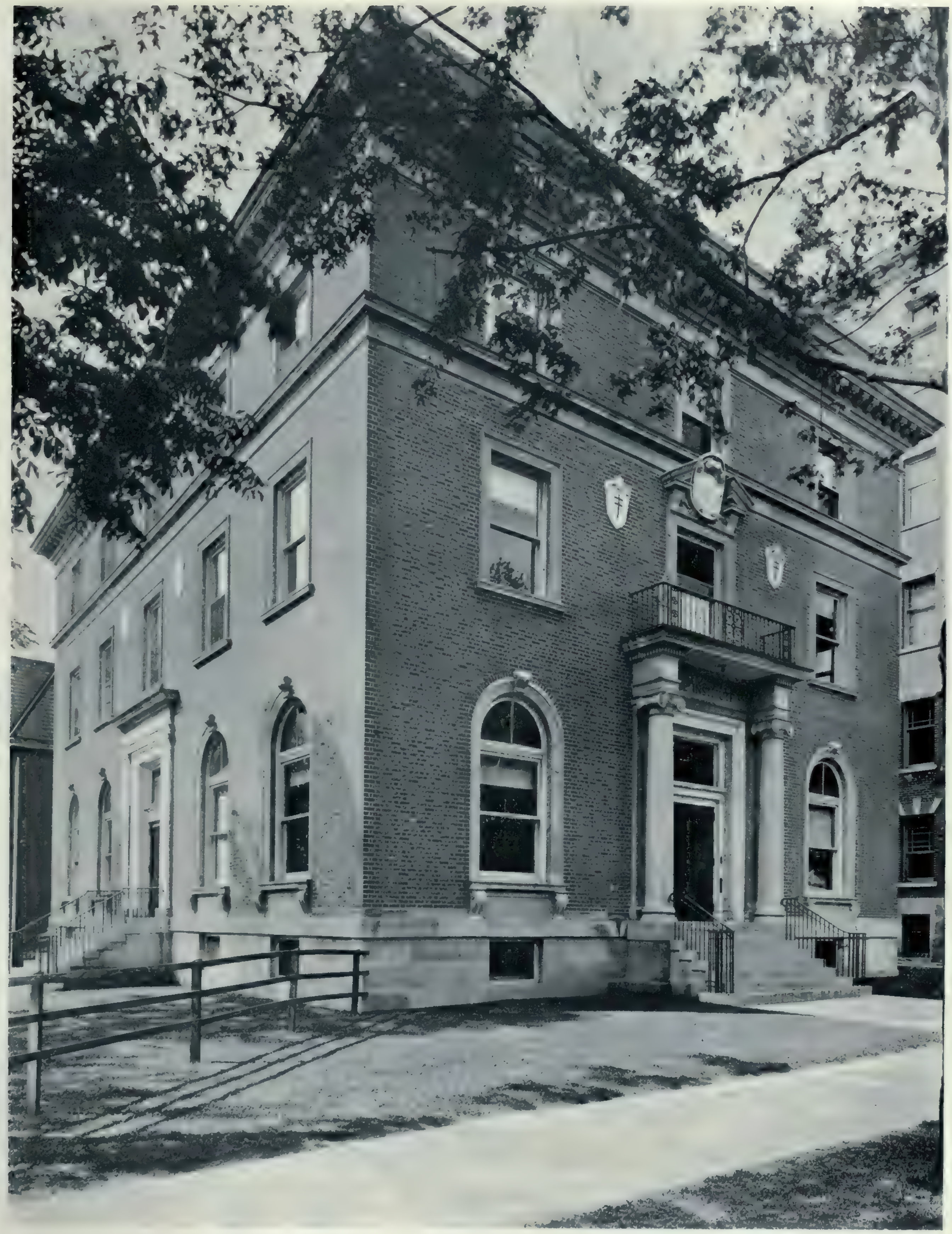
In case water cannot be had in the furnace room a pail filled once a day with water can be supported by a hook placed in a floor beam above the furnace. The pail should have a hole punched in the side near the bottom and a pet cock soldered over the hole. Water can then be allowed to drip slowly through a piece of small hose into the funnel at the upper end of the asbestos strip.

A small hygrometer should be hung near a thermometer in one of the rooms. If a humidity of thirty per cent. to forty per cent. is maintained the temperature of the room can be kept at three degrees to five degrees lower with more comfort than if the humidity is allowed to fall to five per cent. or less.

◆

An influential Canadian company has acquired a site on the Upper Ottawa for the building of a large sulphite mill and paper plant, and the opportunity is being taken to develop a model town adjacent to the mill site for the housing of the employees of the company and others.

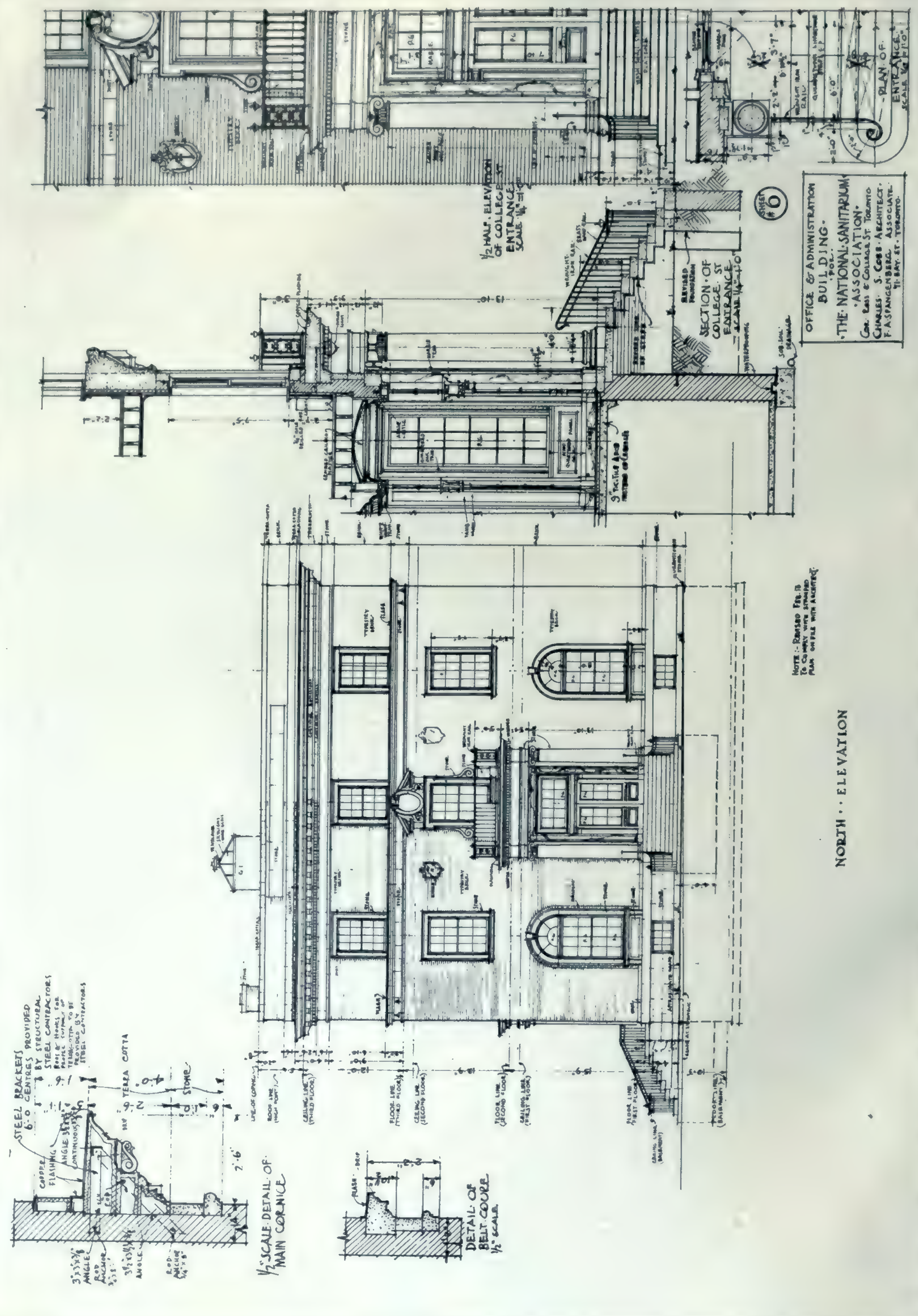
A splendid site has been chosen for the town, which is being laid out according to modern principles of town planning under the direction of Mr. Thomas Adams of the Commission of Conservation. Before any buildings have been erected the line of each street has been blazed through the forest so as to fix the best street locations and to secure the best aspects for the dwellings. Areas are being set aside for open spaces, social centers, churches, schools, etc., in advance. The main approach to the town will be by a street 80 feet wide, passing through a square on which the stores and public buildings will be erected.



GAGE INSTITUTE, TORONTO.

Administrative Offices of the National Sanitarium Association.

CHARLES S. COBB, ARCHITECT.


OFFICE & ADMINISTRATION BUILDING
·FOR·
·THE·NATIONAL·SANITARIUM·
·ASSOCIATION·
COR. BESS & COLLEGE ST. TORONTO
CHARLES. S. COBB. ARCHITECT.
F. A. SPANGENBERG. ASSOCIATE.
71. BAY. ST. TORONTO.
1/2 HALF ELEVATION OF COLLEGE ST ENTRANCE SCALE 1/2"=1'0"
SECTION OF COLLEGE ST ENTRANCE
PLAN OF ENTRANCE
NORTH · · ELEVATION
NOTE :- REVISED FIELD TO COMPLY WITH STAMPED PLAN ON FILE WITH ARCHITECT
STEEL BRACKETS 6'0" CENTRES PROVIDED BY STEEL CONTRACTORS
TERRA COTTA
STONE
COPPER FLASHING
1/2" SCALE DETAIL OF MAIN CORNICE
DETAIL OF BELT COURSE 1/2" SCALE

GAGE INSTITUTE, TORONTO

THE head office of the National Sanitarium Association, at the corner of College and Ross streets, was erected during 1914, and is properly known as the "Gage Institute."

It provides (1) central administrative offices for its affiliated branches, including the two large sanitariums maintained by the association at Weston and Gravenhurst; and (2) modern clinical facilities for the examination of tubercular patients who are sent to either of the two places mentioned for treatment.

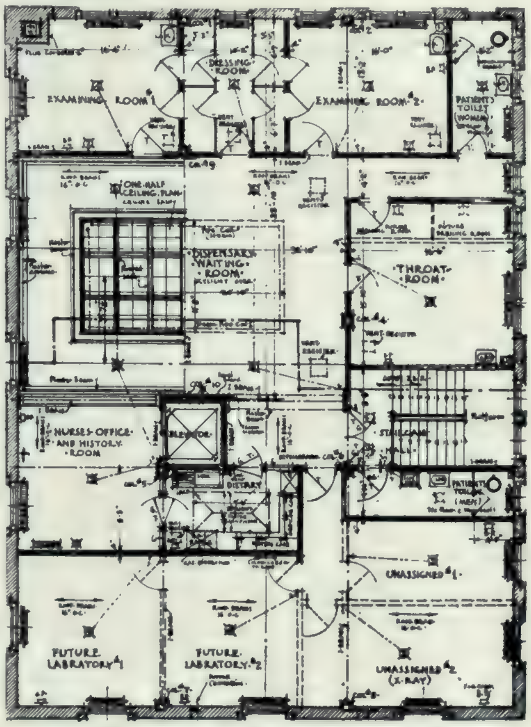
Without any precedent in plan to follow, the architect has evolved a scheme which gives an excellent working arrangement fitted to the individual needs of his client. While related one directly to the other, the arrangement separates the business offices and examination rooms into practically two distinct units. Patients on being admitted are taken directly by the elevator to the third floor, where examinations are conducted, and which provides a free dispensary, waiting room, throat room, X-ray laboratory, dietary, toilets, etc. A top light over the waiting room abundantly lights this floor, and the plan provides for future laboratory requirements.

The business and accounting office and secretary's suite are grouped adjoining the main vestibule and circular reception hall on the main floor. In addition to this there is a separate dispensary vestibule opening on Ross street, and a small auditorium with sloping floors to accommodate about one hundred and fifty persons.

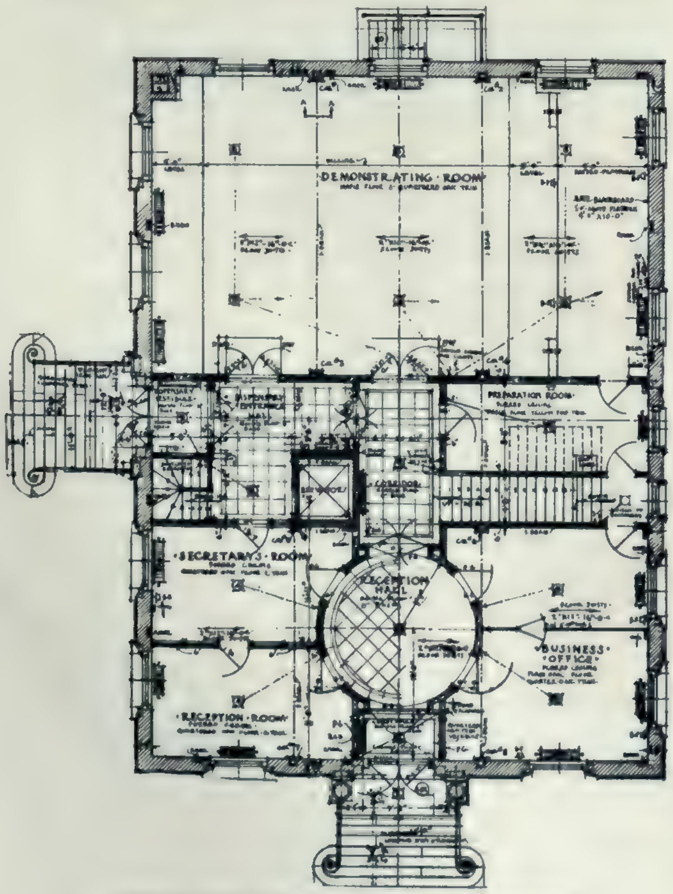
Offices for consulting physicians, a large Board room and quarters for the Samaritans' Club (Women's Auxiliary); together with mailing department, are located on the second floor.

The basement contains the heating system and coal storage, janitor's quarters, staff toilets and store-rooms, and elevator machinery.

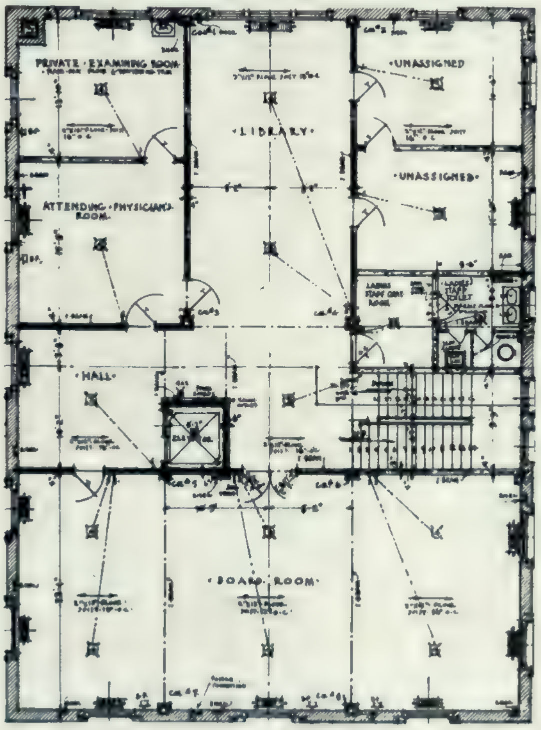
The exterior of the building is of selected grey tapestry brick laid in flemish bond. The trim is of buff Indiana lime-stone with cornice of terra cotta to match; the base courses consisting of buff Queenston stone. Steel is used for the frame work, with columns protected by hollow tile fireproofing. The trim is oak throughout, the floors of the vestibule and reception hall are of tile; and the walls are of enamelled plaster on all floors.



THIRD FLOOR PLAN, GAGE INSTITUTE, TORONTO.



GROUND FLOOR PLAN, GAGE INSTITUTE, TORONTO.



SECOND FLOOR PLAN, GAGE INSTITUTE, TORONTO.

Development of Architectural Design in Canada

By Alfred Chapman.

(Paper read before Royal Architectural Institute of Canada.)

We are in the position to-day of knowing more about the science of building than has ever been known in any previous architectural era. We may possibly know more about architectural design in its broader sense, but we do not know more about the æsthetic side of architecture; that is, the effect upon the senses and emotions.

When I say we may possibly know more about architectural design, I have in mind our great versatility in handling more or less intelligently anything from a skyscraper to a bungalow, or from a mantel to a cathedral, and we can dress these creations up in a Mission, Classic, Renaissance or Gothic character. We can also make the building fit the practical requirements of the organization to be housed, and give the building a character that more or less suggests its utilitarian purpose. We realize to-day, as we never realized before, the importance of this element of giving expression to the innermost character of the function a building serves rather than giving it a conventional, and to a certain extent meaningless, architectural expression. We have also a conception of what planning means that has in it the germ of a far-reaching development. This is clearly seen in the plans submitted for some of the more recent competitions, such as those held for the Government Buildings at Ottawa and the Winnipeg Parliament Buildings, where the arrangement and proportion shown in many of the plans are far beyond the conception held a few years ago.

When we come to the æsthetic side of architecture, by which I mean that element that raises the science of building to the same plane as the great arts of painting, music and sculpture, we have only to consider our dependence upon the great architectural epochs of the past to realize our weakness. How many architects of to-day could, without the assistance of their libraries, design a building with the classical beauty and refinement of a Parthenon, or with the robust and simple treatment of the Baths of Caracalla; or a building with the imaginative aspiration of a Rheims or Rouen Cathedral, or again, with the luxurious and clever composition of the Louvre? If we regard the fine poetic sentiment in the English Gothic collegiate or residential work, we must realize that this sprang from a deep sincerity and feeling in their work that architects of to-day are far from possessing. We cannot design on our own initiative with the perfection of any of these masters, but we have, as before mentioned, a remarkable versatility in producing a semblance to all of them. Furthermore, if we wish to copy them slavishly we can reproduce them with the assistance of an extensive library, but this, after all, is archeology, not living architecture.

This is what appears to me to be the position we are in at present, and now let us trace the steps by which we have arrived at this stage, after which I would like to consider certain elements affecting our further development.

About sixty years ago most of our best work was done by men who were trained in England, and who brought with them a sincerity and conservative restraint in their work which resulted in a dignified and sober treatment of Classic or Renaissance buildings, and a sincere treatment of Gothic that showed a familiarity with the better class of English work. Residential street architecture was treated then with more urban dignity than in the years following, particularly in Toronto. This is a curious anachronism, for consider how small the cities were at that time compared with what they are now. Our business districts were built up more substantially, and with more dignity, all of which expressed the effect of the solidity and thoroughness of English traditions. Architects of this period, however, kept carefully within bounds, and did not indulge in flights of imagination or attempts to solve new problems in new ways, and the school from which they drew their inspiration was rather dogmatic and limited, though sound and safe as far as it went.

As this period gradually passed and the flow of prosperity, occasioned by our rapid growth, spread over the country, we seem to have broken away from the influence of earlier traditions. The rapid expansion necessary, and the limited amount of capital to meet this expansion, led us into less thorough methods of construction and less careful designing. Owing to there being no restraint upon the practice of architecture other than the rather uncertain discretion of the public, we naturally find at times like these many practising architecture who had not sufficient training or equipment, and this state of affairs led to a lowering of the standard and created the darkest architectural period of Canada's career. This flow of prosperity and building activity, however, died down, and Canada became subject to a good many years of depression, in which there were not a great many buildings erected.

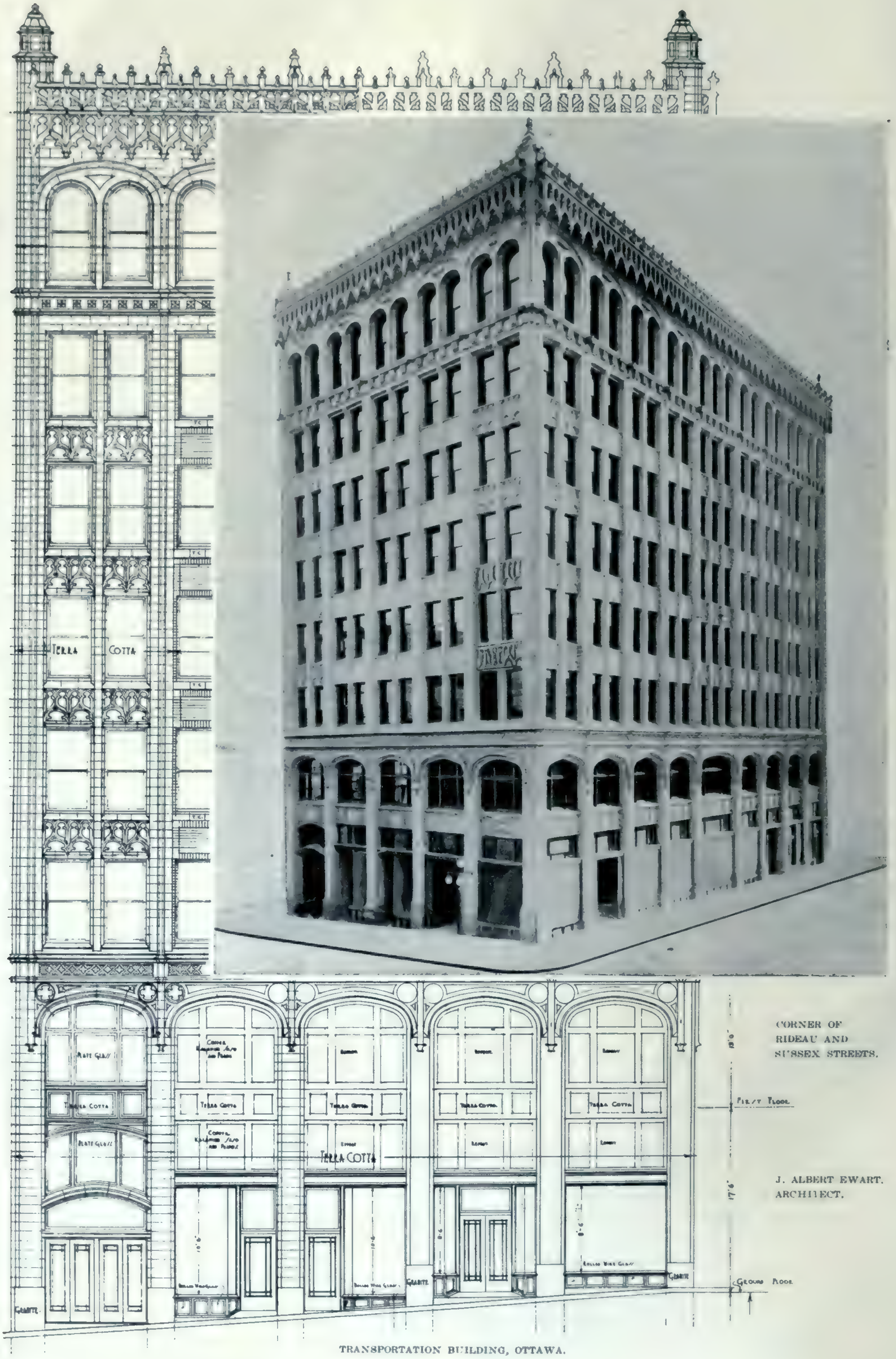
In the earlier part of this century Canada began to realize its great future, and to waken up and go ahead by leaps and bounds, and the building expansion following assumed enormous proportions. This period gave birth to higher architectural aspirations, due probably in a large measure to the great architectural development of the United States, which, in itself, was due to the European training which led to the handling of problems in a freer and broader spirit, and also led to a more penetrating study of the old work. Undoubtedly the development we have undergone in this last era of building activity places us farther on the road to architectural proficiency than we have ever been. We have more of a grasp of the real architectural problem, and we realize that the main element to be sought is a successful plan, and next to that an expression that leads the mind to grasp the essential character of the organization clothed by the building. We are emancipated from the necessity of cramping the problem to suit a preconceived design. When we compare, for instance, a modern station, office building, bank, library or school with the buildings housing similar organizations fifty years ago, we realize that we have developed a much broader grasp of the problem, but this ability is, after all, only elementary, and leaves us on the threshold of a really great architectural era. Are we going steadily forward in the great building expansion that is bound to come to Canada sooner or later, or shall we blunder along in a mediocre way? I think the threshold upon which we have stepped is also a cross-roads. There are some alarming factors in present day conditions which make me think the choice of roads at this juncture is of vital importance to our future architectural development.

The days of handling a large architectural practice in a small professional way are past. Consider the organization that is required to efficiently control a large amount of building under present-day conditions. First, there is the business and administration, then there is the structural part, the mechanical part, the supervision, and finally the creating and designing; in short, an efficient organization to create and purchase an article, or articles, totalling in value perhaps a million or so of dollars a year. We have not many of these organizations in Canada, but we will have in future years, and, what is more, to-day we have to meet the competition of such architectural organizations in the United States, and also of large building corporations encroaching upon the architects' province. This means that architecture to meet present-day conditions must be a highly organized business, and not a one-man profession, as it used to be, and I believe that this is a tendency growing out of modern economic conditions that cannot be altered.

The fact that we have to consider in this paper is its influence on architectural design. Such a development as the above means specialization and extreme proficiency in design, and this means at least ten years of training under the best of advantages. There are many in the United States being trained to fulfil these modern requirements in the way of design, but practically none in Canada. Our opportunity for training men is at a very low stage. We have not the control over the students that the old system of indenture gave us, and we have no ateliers like they have in the States which make an excellent substitute for the former system. It is true we have our architectural colleges, but they only carry the student a short way along the road he has to go. In view of this, I venture to say that the head designers in the largest offices in Canada ten years from now will not be Canadian-trained men, and probably not Canadians, unless more action is taken in an educative line immediately after the war.

There is a very serious aspect to this question of the necessity of strong organizations to cope with the modern building conditions, and that is, if architects do not organize to meet these conditions, large building corporations, with every facility for extensive capitalization, will. In considering what effect this would have upon design, it can easily be seen that the building corporation's interest being to sell an article at a profit, they are not going to obtain the best possible solution of the problem unless it is to their monetary advantage to do so; and it is only to their advantage to sell an article that in a general way meets the requirements of the purchasing public. Although I believe the understanding of the intelligent public is the mainspring of all great developments in art, this understanding is generally subconscious, and it is the artist's work to tap the spring and develop it. This means conscientious pioneer work, which would never be to the interest of a building corporation to undertake. Undoubtedly, then, if building gets into the hands of business corporations whose sole interest is profit, architectural design will not arrive at the development which it would if controlled by the architect whose object should be to lead the client to the best solution of the problem in hand, even if he knows his efforts may not be appreciated for several years to come. We have only to consider the increasing control of large building operations by corporations on this continent to realize that this is not an imaginary but a real danger to the existence of architecture as a great art. By maintaining the highest ideals, and by educational facilities and a broad spirit of organized work together, we can maintain control of the situation and the spur of the danger, above mentioned, should accelerate the development of architectural design.

We can hardly hope to realize to the full our present ideals for a decade or more, even if we rise to meet the conditions referred to above. The training of the senses for pure beauty in form, rhythm and color can only be accomplished by years of constant effort backed by great enthusiasm, and this in itself needs to be sustained by the intelligent appreciation of the public whom we serve. To cultivate this appreciation of the public, which is the solid foundation for all art, and also to devise means whereby it will be satisfied within the bounds of Canada, seems to me the present-day duty to which we should devote our energies.



CORNER OF
RIDEAU AND
SUSSEX STREETS.

J. ALBERT EWART,
ARCHITECT.

TRANSPORTATION BUILDING, OTTAWA.

Transportation Building, Ottawa

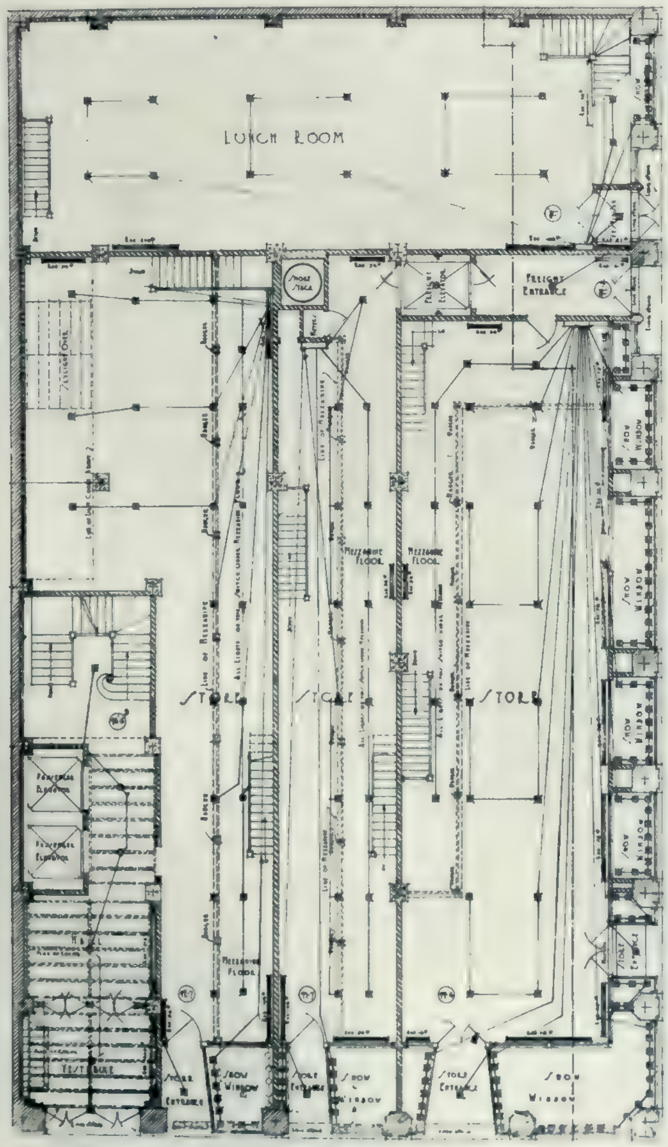
LOCATED at one of the most prominent intersections, the Transportation Building represents a recent development in Ottawa's business sections which visualizes the demand for modern store and office accommodations.

The design, which introduces a Gothic motif of simple form in the two facades, exhibits the vertical feeling characteristic of the modern tendency in buildings for this purpose, and is expressed in soft grey terra cotta with brick panels of a similar shade for portions of the front between the second and sixth storeys. Rising from a polished granite base, the piers are carried up to the top of the first floor and are linked together with arches over which a diapered band is carried round the two street fronts, forming a base for the pier above. At the level of the sixth floor another band is introduced ornamented with medallions, which forms a sill course for windows designed with elliptic heads in the upper storey. Above this is a cornice formed of a series of pendentives with perforated flamboyant panels.

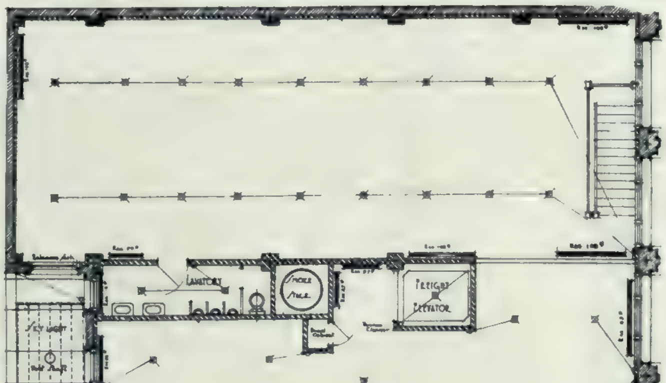
The frontage of the building extends 66 feet on Rideau street, and 116 feet on Sussex street. The main front on Rideau street is divided into five bays, four of which are used for stores and one as an entrance to the offices. These stores have a uniform depth of 90 feet, while the remaining portion on the Sussex street front is given over to a freight entrance with two smaller stores at the south end.

Entrance to the elevator and offices is through a vestibule and hall 11 feet wide and 16 feet high. Here the walls are panelled to a height of 12 feet with wide statuary marble in large panels, having light veined Broccadillo stiles. The base consists of dark grey Lapanto, and this also is used as a border for the floor of pink Tennessee marble. Above the marble panelling is a frieze of Gothic design employing the same motif as used on the exterior of the building, and terminating with a ribbed ceiling, having a slightly barrelled vault.

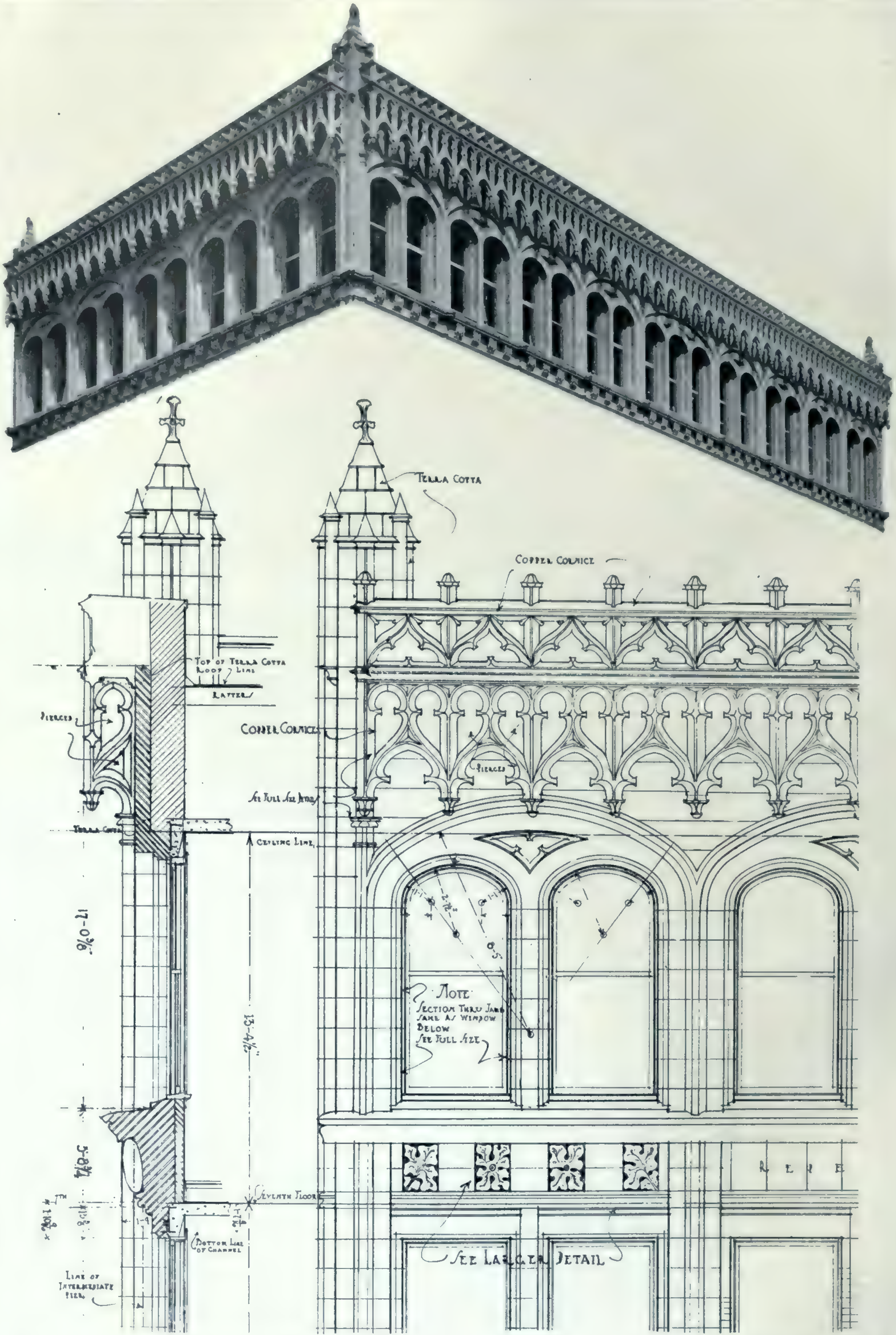
The staircase to the first floor is situated beyond the elevators and this is also executed with



GROUND FLOOR PLAN, TRANSPORTATION BUILDING, OTTAWA.



TYPICAL OFFICE FLOOR PLAN, TRANSPORTATION BUILDING, OTTAWA.



DETAIL OF CORNICE, TRANSPORTATION BUILDING, OTTAWA. J. ALBERT EWART, ARCHITECT.

a Gothic motif with a balustrade and newels. From the first floor to the roof the staircase is of the simple character, and is enclosed with kalamine and wired glass partitions, thus forming an interior smoke-proof fire-escape.

The interior partitions dividing the offices are a patented sectional type containing double panels and double glass, so as to procure satisfactory sound proof results. The wood used is a high grade birch, stained a light grey in order to make the offices as light as possible.

All the equipment is modern throughout. The lighting fixtures are designed in the Gothic style in keeping with the architectural treatment. The elevators consist of two passenger and one freight elevator all of the traction type. The former is of a double screw model with a speed of from 400 to 500 feet a minute, while the latter consists of a single screw with a speed of 250 feet a minute. The shafts are constructed of terra cotta with kalamine doors at each floor, equipped with modern door controllers.

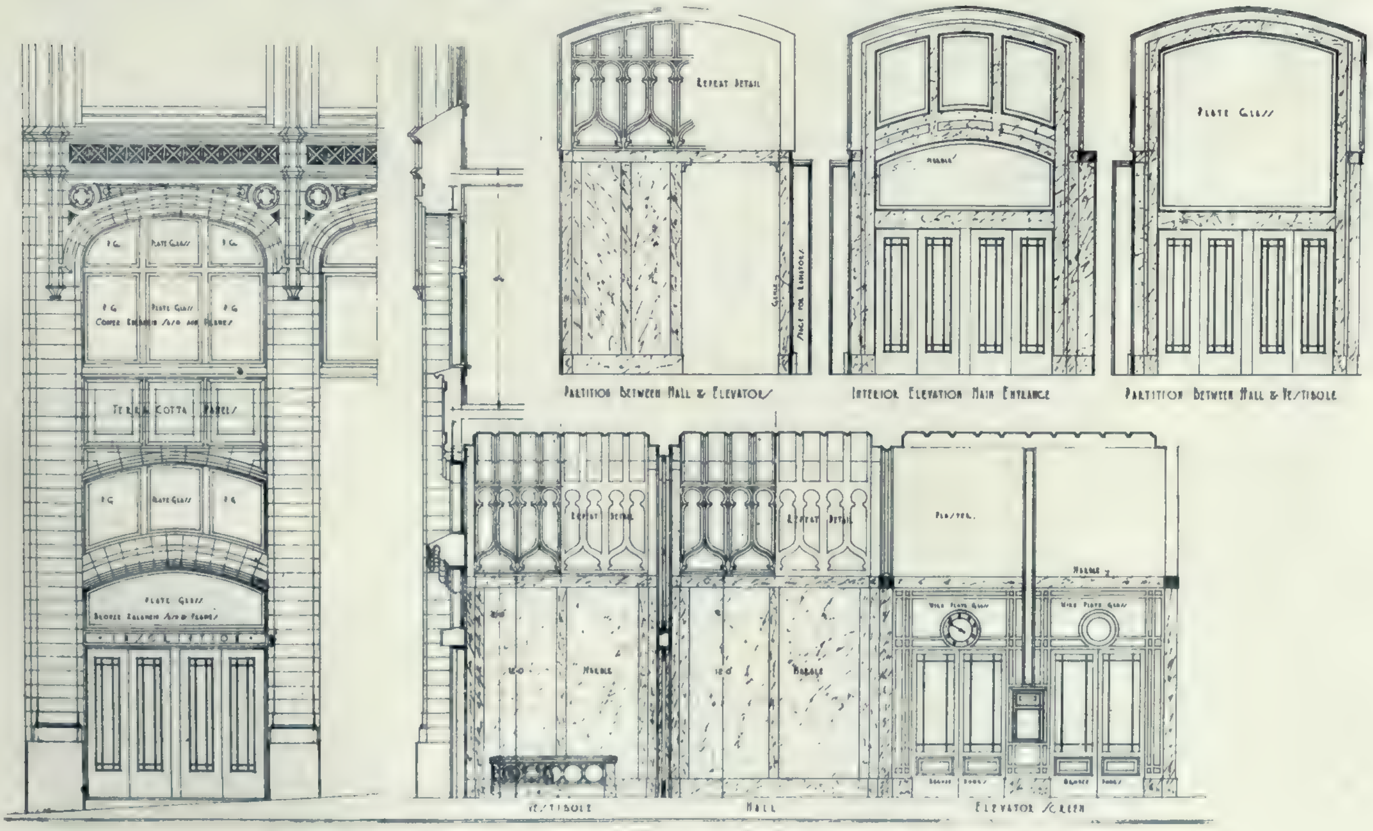
The heating system is of the simple steam vapor type with modulating valves on each radiator. The boiler consists of 125 horse power units, 72 inches in diameter and 14 feet long. A special setting has been used for these boilers whereby the gases, after passing the bridge wall, are carried under the shell towards the rear, and are divided and returned on each side of the boiler towards the front. Here they pass through the lower half of the tubes to the rear of the boiler and back again to the front through the upper half to the smoke breaching. A reinforced plate is placed horizontally across the boiler between the head and the clean-out door. With this type of setting the temperature of the gases entering the stack is much lower than with the ordinary setting and a greater heat efficiency is obtained.

In excavating for the foundation of the building, rock was encountered over the entire site, and some three thousand yards had to be removed to obtain the required depth for the basement and boiler room.

The steel work for the superstructure was started in the middle of March, 1916, and was completely up four weeks later. As the steel work progressed, the concrete floor slabs were laid and the other trades were organized to follow in order; the entire structure being enclosed and roofed by the first of June and ready for occupancy two months later, following the completion of a portion of the interior for the Imperial Munitions Board, who desired possession earlier than the completion date.

POWER DAM

A concern known as the Power Development Company, Limited, has given notice of application to the Minister of Public Works for authority to construct a dam in the St. Lawrence, near Cornwall, and to provide certain compensating works in connection with it. The proposition, it is thought, might be the reincarnation of the old Long Sault scheme, which was defeated after a bitter fight in Parliament. The company is incorporated with a capital of $500,000.


Repeat Detail
Plate Glass
Marble
Terra Cotta Panel
Plaster
Partition Between Hall & Elevator
Interior Elevation Main Entrance
Partition Between Hall & Vestibule
Vestibule
Hall
Elevator Screen

DETAIL OF ENTRANCE AND GROUND FLOOR CORRIDOR, TRANSPORTATION BUILDING, OTTAWA.

Royal Architectural Institute of Canada

ON October 1st and 2nd the Tenth Annual Convention of the Royal Architectural Institute of Canada was held at Ottawa, but owing to the attendance being smaller than expected, the meeting was adjourned to a future date, the President being authorized to call the adjourned meeting to be held at Toronto in December or January, at the same time the Convention of the Ontario Association of Architects is held.

During war time the officers and members of the Royal Institute of Architects are desirous of holding the organization together and making such progress as is possible along the lines of improving educational facilities and obtaining more favorable legislation; protecting Canadian architects from unfair competition from other countries.

At the Ottawa gathering a very interesting discussion took place following the reading of a paper by Mr. J. P. Hynes, of Toronto, the consensus of opinion being that Mr. Hynes' suggestions should be further discussed by the architects throughout Canada and definite action taken to give greater protection to the Canadian profession. Very interesting papers were also submitted by Mr. W. A. Langton, Toronto, and Mr. Chapman, Toronto.

The most important action of the Ottawa convention was the acceptance of the application for legislation from the Architectural Institute of British Columbia. There have been two architectural societies in British Columbia, but it being understood that only one is now in existence, it was taken into the Royal Architectural Institute of Canada, this completing the chain of provincial societies from Quebec to the Pacific Coast.

It is hoped that during the coming year action will be taken to organize the architects in Nova Scotia, New Brunswick and Prince Edward Island into a Maritime Province association of architects.

The executive plan to hold the annual convention of the Royal Architectural Institute of Canada in a different province each year, holding the national convention at the same time as the provincial convention meets, the aim being to encourage a larger attendance at both the national and provincial meetings.

The ninth annual convention was held in Quebec a year ago, and if the tenth convention is held in Toronto shortly, jointly with the meeting of the Ontario Association of Architects, it would probably be arranged to hold the eleventh convention at Winnipeg next year at the same time as the Manitoba Association of Architects holds its annual convention.

CONSTRUCTION is pleased to accept the invitation of the Royal Architectural Institute of Canada to publish the report of its convention and send copies to every member of the institute throughout the various provinces of Canada.

R. A. I. C. PROCEEDINGS

The meeting was called to order by the president, Mr. J. P. Ouellet at 10 a.m., the following members having signed the register as being in attendance: Messrs. J. P. Ouellet, A. Frank Wickson, L. H. Jordon, A. Chausse, R. M. Ogilvie, E. E. Temple, C. Brodeur, A. J. Barclay, J. P. MacLaren, John A. Pearson, Arthur R. Brydon.

In his opening remarks the president stated that the object of the meeting was strictly a business one, and that he would forego anything in the nature of an annual address in order that the matters to be dealt with could be taken up without delay. He referred briefly to the meeting held at Quebec City last year, stating that the work of three years, practically speaking, had to be attended to. There was a meeting of the council, a general meeting dealing with the business of the two preceding years, the election of members to the council, and proceedings in reference to the affairs of the institute for the year in which the meeting was held.

Mr. Chausse, honorary secretary, explained that the Quebec meeting comprised the seventh, eighth and ninth meetings and occupied two days. In reference to the minutes of the preceding meetings, Mr. Chausse stated that they were quite voluminous, and that it was usually the custom to accept them as read, and asked if this should be understood accordingly.

Mr. Wickson did not think that the meeting could pass or modify the minutes, not having a quorum, but perhaps could receive them, and this was adopted.

DELEGATES OF FEDERATED ASSOCIATIONS.

Delegates from the federated associations 1917-18 and 1918 council were reported by Mr. Chausse, honorary secretary, as follows:

Alberta Association of Architects—Richard P. Blackey, Calgary, Alta.; W. D. Cromarty, Edmonton, Alta.

Manitoba Association of Architects—L. H. Jordan, Winnipeg, Man.; H. E. Matthews, Winnipeg, Man.; J. H. G. Russell, Winnipeg, Man.

Ontario Association of Architects—C. H. Acton Bond, Toronto, Ont.; A. Frank Wickson, Toronto, Ont.; J. P. Hynes, Toronto, Ont..

Province of Quebec Association of Architects—D. R. Brown, Montreal, Que.; Alcide Chausse, Montreal, Que.; J. P. Ouellet, Quebec, Que.; J. Perrault, Montreal, Que.; Herbert Raine, Montreal, Que.

The Saskatchewan Association of Architects have not yet sent in the names of their delegates. I telegraphed them two weeks ago, but have not received any answer.

President: We shall now proceed to the next item, which is the application for federation from the Architectural Institute of British Columbia (incorporated).

Mr. Chausse: This was discussed at the meeting of the council held at Ottawa in April last. A letter was read from the secretary of the Architectural Institute of British Columbia to the effect that the other architectural organization, which was known as the Institute of Architects of British Columbia, had gone out of existence, and asking that the Architectural Institute of British Columbia be federated with the Royal Institute. At the meeting of the council held yesterday, the following motion was adopted:

"Whereas, the council is in receipt of a letter from the secretary of the Architectural Institute of British Columbia stating that the British Columbia Association of Architects now no longer exists, and asking for federation with the R.A.I.C.; therefore, be it resolved that the Architectural Institute of British Columbia be admitted to the R.A.I.C., providing (a) that satisfactory evidence be forwarded that the British Columbia Association of Architects has been disbanded, and (b) that fees at the rate of $2.00 for each member be forwarded, with a complete list of the members and a list of delegates to the council."

Mr. Wickson: I suppose as mover of that motion I should say the whole council felt that as our only information regarding the disbanding or demobilizing, or whatever you may call it, of the British Columbia Association came through the secretary of the rival association, we thought that in justice to the old association we ought to have something from it stating that this was the case, and we thought it was only fair and proper to put it up to the British Columbia Institute to furnish this information. All the secretary of that organization would have to do would be to get a letter from the secretary, or the former president of the association, to the effect that it is no longer in existence, then, according to this resolution, the Architectural Institute of British Columbia would automatically become federated with us. You will remember we had quite a time over that, and there was quite a lot of correspondence in regard to the subject, because each association was quite determined to be the one which would be federated.

President: There is one now which has a charter. It is not by any means a close charter, but it is a charter from the Provincial Government. That is the one we decided we would invite to join us, upon presentation of their credentials.

Mr. Chausse: They were incorporated by the Provincial Government of British Columbia on June 10th, 1914.

Mr. Jordan: I suppose we have to recognize that this meeting can only take communication of matters which are pending, as matters of information and general interest, and the only ultimate step we can take is to adjourn to some agreed time, upon the call of the president, for final action.

Mr. Wickson: This is a matter for the council. If the British Columbia Institute complies with the conditions we have laid down, the council will admit them, and it is not necessary for them to come back to the association for admission.

Mr. Wrigley (representing "Construction"): As Mr. Chausse told you before the meeting opened, we will be pleased to publish the minutes of this meeting in "Construction," which is largely circulated throughout British Columbia. The fact that the minutes appear in it would permit those who are members of the British Columbia Association to see what is being done, and would give them an opportunity of taking whatever steps they might see fit.

Mr. Wickson: But, as a matter of courtesy to the members of the old organization, we do not think it right to accept the new association without something more than a mere statement that the other has been disbanded.

Mr. Wrigley: Still, the publication of what has transpired here would spread the information better, because you would only reach one or two gentlemen by correspondence.

Mr. Chausse: That is perfectly true. I may say I had an interview with Mr. Wrigley, of "Construction," and he tells me that paper will publish the proceedings of our meeting here today, including the papers which may be read. He has agreed to send a copy of the issue containing the minutes to each member of the institute. This will save us the expense of publishing our proceedings this year.

President: I am sure we are very grateful to the publishers of "Construction" for this kindness, and we shall be very pleased, indeed, to take advantage of the offer.

APPOINTMENT OF AUDITOR.

President: We shall now proceed to the next item of business, which is the appointment of an auditor.

Mr. Chausse: Generally the auditor was appointed by the assembly, and has usually been a gentleman who resided in the same city as the treasurer. This year we have no treasurer. The president asked me to fulfil the functions of that office until a treasurer is elected. This was confirmed by the council meeting yesterday. I would suggest that this matter be left over until such time as the treasurer is appointed, then we may appoint an auditor from the city in which the treasurer resides.

Mr. Jordan: In any event we cannot appoint an auditor today, seeing that we have no quorum.

REPORT OF COUNCIL.

Mr. Chausse: There was a meeting of the council yesterday, but there was no quorum, and all the business was transacted with the understanding that it should be sanctioned at the general assembly. The following matters were dealt with at the council meeting: The secretary was appointed to act as treasurer pro tem.; the treasurer's report was received, showing a balance of $935.40; the motion regarding the Architectural Institute of British Columbia, which has just been read, was adopted; it was resolved that steps be taken to send to the different associations and to the members of the Royal Institute the reports of the treasurer and auditor, as well as the proceedings of the assembly, including the papers read. This will now be done through the courtesy of "Construction."

The following resolution was adopted, on motion of Mr. A. F. Wickson, seconded by Mr. Alcide Chausse: "That the Council of the Royal Architectural Institute of Canada do hereby record the sorrow with which it received the news of the death of its honorary treasurer, Mr. J. W. H. Watts, R.C.A., whose outstanding ability, upright character and kindly nature had earned the admiration, respect and affection of all his colleagues, and shed lustre on his own name, and on that of his profession throughout Canada, as well as beyond its borders, and whose untimely demise has left a gap in the minds and in the hearts of his colleagues that no other can fill. That a copy of this resolution be forwarded to his family, with the expression of the heartfelt sympathy of this council and of the members of the Royal Architectural Institute of Canada, whom it represents."

Mr. Wickson: Although we cannot do any business, I would suggest that it would be a good idea if the minutes of the council meetings, which do not happen to be published, were forwarded to the different provincial associations. It would not be a very serious undertaking so far as the work involved is concerned, and I think it would be advantageous in the sense that those organizations would know what the council was doing, and would keep really more in touch with what was going on in the institute.

Mr. Jordan: I think that is an excellent idea.

Mr. Chausse: On the other hand, it might be an incentive to preventing the members of the council from attending the meetings, because they might get the idea that there would be no necessity of attending the meetings, knowing that they would get a report of what transpired. In any event, it would be a very simple matter to try it, and it might produce good results.

HONORABLE SECRETARY'S REPORT.

Mr. Chausse then presented the following report:

Montreal, 25th September, 1917.

To the President, the Council and the Members of the Royal Architectural Institute of Canada:

Gentlemen,—I beg leave to submit my tenth annual report as honorary secretary of the Royal Architectural Institute of Canada.

This organization, founded on the 19th August, 1907, under the name of the Institute of Architects of Canada, was incorporated by the Dominion Government on the 16th June, 1908, as the Architectural Institute of Canada. On June 2nd, 1909, His Majesty King Edward VII., granted us permission to adopt the prefix "Royal" to the name of the Architectural Institute of Canada. Up to the year 1912 the Royal Architectural Institute of Canada was independent from any other association of architects in Canada, but was allied with the Royal Institute of British Architects. After conference with the various provincial associations of architects, it was decided to amend our charter in order to federate with the provincial architectural associations throughout Canada recognized by the Royal Institute. A new charter was passed by the Dominion Parliament, and this society was incorporated under its present title of "The Royal Architectural Institute of Canada," or "L'Institut Royal d'Architecture du Canada."

The new organization comprised the entire membership of the following provincial associations of architects:

Alberta Association of Architects.
Manitoba Association of Architects.
Ontario Association of Architects.
Province of Quebec Association of Architects.
Saskatchewan Association of Architects

There was no association of architects in the Provinces of Nova Scotia, New Brunswick and Prince Edward Island. In British Columbia there were two architectural bodies, the British Columbia Society of Architects and the Architectural Institute of British Columbia. As we could not federate with two associations in one province the architects of British Columbia could not join the membership of the Royal Architectural Institute of Canada. Before we meet again it is hoped that the door will be opened to our colleagues of the Western Province, as negotiations are now under way for the entrance of the Architectural Institute of British Columbia into the membership of our institute. This will be done only if, as we have been informed, the British Columbia Society of Architects has ceased to exist. It is to be noted that the Architectural Institute of British Columbia was incorporated on June 10th, 1914, by the Legislature of the Province of British Columbia.

As already stated, every member of a federated provincial association of architects is ipso facto a member of the R.A.I.C., and each provincial society is represented on the council of the R.A.I.C., by two delegates for forty members or less, and one additional delegate for each additional forty members or fraction thereof. This council elects the officers of the R.A.I.C.

During the fiscal year 1916-1917 there have been two meetings of the council, one at Quebec, on September 9th, 1916, at which meeting the following officers were elected:

President, J. P. Ouellet; Vice-Presidents, A. Frank Wickson and W. C. Van Egmond; Hon. Secretary, Alcide Chausse; Hon. Treasurer, J. W. H. Watts.

It was decided to retain rooms for the office of the R.A.I.C. at No. 367 Beaver Hall Square, Montreal, at an annual rental of $150.00; to retain the services of an assistant secretary at an annual salary of $200.00, and to fix the pro rata rate of $2.00 per member for the contribution of the provincial associations for the year 1916-1917. The hon. treasurer was authorized to pay the travelling expenses of the president, the hon. secretary and the hon. treasurer, attending council meetings and the Tenth General Annual Assembly. It was decided to leave the choice of the place for the next general annual assembly on the table until the next meeting of the council.

The second meeting of the council was held at Ottawa on the 28th April, 1917. It was decided to hold the Tenth General Annual Assembly at Ottawa, on the first and second October, 1917. The sum of $100.00 was appropriated for the sinking of a die for the R.A.I.C. medal, from a design to be chosen by the president. The question of the federation of the Architectural Institute of British Columbia was considered, but no decision was arrived at.

I regret to chronicle the death of my friend, the honorary treasurer of the Royal Architectural Institute of Canada since its foundation. Mr. J. W. H. Watts, R.C.A., was a model treasurer, and during the ten years he was an officer of this institute, he never missed a meeting of the council or an annual assembly, in Ottawa, Toronto, Montreal, Quebec, Winnipeg and Calgary. He was one of the founders of the institute, and it was through his energy and persistence that the R.A.I.C. is now a prosperous organization. Mr. Watts died at his home, Ottawa, on Sunday evening, August 26th, 1917.

Respectfully submitted,
ALCIDE CHAUSSE,
Honorary Secretary.

On motion of Mr. Jordan, seconded by Mr. Wickson, the report just presented by the honorary secretary was received.

TREASURER'S AND AUDITOR'S REPORT.

President: We shall now proceed to the receiving of the reports of the hon. treasurer and the auditor.

Mr. Chausse: When I heard of Mr. Watts' death I wrote to the president asking him what I should do about the books and papers of the association. He told me to communicate with Mr. Watts' family, and have them send me all the books. This I did. It was found that Mr. Watts had balanced his cash book about two days before he died, so the auditor's work was very easy. I had all the books audited by Mr. P. A. Gagnon, chartered accountant, Montreal, and his report is as follows:

Royal Architectural Institute of Canada.
Statement of Cash Receipts and Disbursements for the Year Ending August 31st, 1917.

Receipts.

Balance in bank September 1st, 1916	$907.00
February 22nd, 1917, life membership of $100.00 with interest (transferred)	126.99
July 6—Ontario Association of Architects, 1915-1916	268.00
July 6—Quebec Association of Architects, 1917-1918	280.00
Aug. 22—Manitoba Association of Architects, 1917-1918	80.00
May 31—Bank interest to May 31st, 1917	19.73
	$1,681.72

Disbursements.

Sept. 12—Typewriting report and postage (1916)	$1.76
Sept. 30—Travelling expenses, J. H. G. Russell	124.55
Sept. 30—Travelling expenses, Alcide Chausse	40.21
Sept. 30—Travelling expenses, John W. H. Watts	31.70
Sept. 30—Stationery and printing, J. Bourguignon	15.25
Oct. 30—A. W. G. MacAlister	125.00
Dec. 2—Postage	2.00
Feb. 22—J. P. Ouellet	50.00
April 28—Rent of room for council meeting	5.00
July 17—Salary Miss V. Morin to June 30, 1917	200.00
July 17—Province of Quebec Association of Architects 1916-1917	150.00
Aug. 31—Discount on three cheques	.85
Aug. 31—Balance in bank	935.40
	$1,681.72

Audited and verified as per my report of this date,

P. A. GAGNON, Chartered Accountant.
ALCIDE CHAUSSE, Acting Hon. Treas.

Montreal, September 27th, 1917.

Montreal, September 27th, 1917.

To the President, Royal Architectural Institute of Canada:

Dear Sir,—I beg to report that I have audited the cash receipts and disbursements of your institute for the fiscal year ended August 31st, 1917, including the vouchers, and I certify that the whole is correct.

The balance in bank has also been verified, and agrees with the cash book balance.

It has been impossible for me to check up the sources of revenue of your association, particularly the arrears of your members, having no list of your members in my possession

I suggest that at the end of every fiscal year a list of members in good standing be attached to the treasurer's report, also a statement of assets and liabilities.

Respectfully submitted.
Yours truly, P. A. GAGNON.

Mr. Chausse: It is practically impossible to give the list of members as he suggests. We get the list of members from the societies with their cheques. If they do not send a cheque we do not know if they have one hundred members or fifty.

Mr. Wickson: I think that could be overcome by requesting the different provincial associations to send a list of their members.

Mr. Chausse: We do that every year. We write every society asking for a complete list of their officers, the names of their delegates, and a list of their members. Some reply at once, but some have not replied for two years.

Mr. Wickson: Have those who replied sent the names of the members, or have they just sent the number of members they have?

Mr. Chausse: They send the names each year. This list is checked with the list we already have, and the new names are added, or names are taken off as may be necessary. However, as I say, we only get the names with the cheques.

PUBLIC MONUMENTS.

Mr. Chausse read the following letter from Mr. Edmund Burke, of Toronto, in reference to the erection of public monuments:

Toronto, September 20th, 1917.

Alcide Chausse, Esq., Hon. Secretary Royal Architectural Institute of Canada, 367 Beaver Hall Square, Montreal, Que.

Dear Mr. Chausse: In view of the probable number of public monuments which will doubtless be erected at the close of this terrible war, would it not be well for the institute to make some move with regard to the appointment of an art jury to pass upon proposed designs. If Government assistance, both Federal and Provincial, could be secured, making such jury or juries official and authoritative, it might be made still more effective. There will be great danger of abortions in the way of monuments if some artistic supervision is not provided, and it seems to me that now would be the time to get the machinery into operation. Doubtless the various provincial associations would be interested in furthering such a scheme.

Yours truly,
EDMUND BURKE.

Mr. Wickson: While we cannot do anything officially in connection with the matter, there would be no harm in the secretary notifying the different provincial associations of the suggestion contained in Mr. Burke's letter, and they could, perhaps, act on it. It seems to me this is more of a provincial question. The Dominion Government could not, for instance, interfere with a monument that was put up in Ontario or Quebec.

Mr. Chausse: I will write to the provincial associations and inform them that this suggestion has been received, and that we submit it for their consideration.

PLACE OF NEXT MEETING.

The president stated that there was nothing before the meeting in regards to notices of motion, and that they would proceed to the selection of a place for the next general annual assembly.

Mr. Chausse: I suggest that inasmuch as this is not, so to speak, a legal meeting, we should try to meet at the same time as either the Quebec association or the Ontario association. I think if this were done we would be sure of a quorum. It might be arranged that the provincial society could have their meeting the first day, and the Royal Institute have its meeting on the second day. That might help to bring the members to the meeting, and be to the advantage of both organizations.

President: When does the Ontario society meet, Mr. Wickson?

Mr. Wickson: Their regular meeting is usually held about this time of the year, but we have called off our meeting for this year. We had it arranged for London, I think, and we sent out a circular letter to ascertain how many would come. We found there would not be a sufficient number to make it worth while holding the meeting, so we called it off.

Mr. Chausse: The Quebec association will meet in January. I may say that we had a lot of trouble last year to get a quorum for our meeting at Quebec, but we finally succeeded. It seems to me if we met jointly with the local body we would be able to get a quorum without any difficulty. If we decide to do that, it would simply mean that this meeting would be adjourned until another day.

Mr. Jordan: I would be rather in favor of adjourning to-day, to meet again at the will of the president, who will use his discretion in calling the meeting, being governed by the circumstances. I also am in favor of the policy outlined by Mr. Chausse, if it would encourage attendance.

Mr. Chausse: In any event it would be an interesting experiment, and I feel satisfied it would help the attendance of both organizations.

Mr. Jordan: It strikes me it would be a good idea to have the meeting in Toronto, and get acquainted with the Toronto architects.

Mr. Chausse: The difficulty is that we do not know when the Toronto architects will hold their meeting. If they meet within the next six weeks, say, there would not be time for us to send out our notices. It is possible there may be a notice to amend the by-laws, which is a very important thing. This may be done, because we find a quorum of seven for the council is too much. It is hard to get a quorum on account of the fact that the delegates are scattered all over Canada.

President: If Mr. Wickson would undertake to let us know what the Ontario association is going to do, and when the meeting will be held in Toronto, we might be able to govern ourselves accordingly.

Mr. Jordan: That was my idea in leaving the calling of the meeting in the hands of the president.

Mr. Chausse: The present meeting is held in Ontario, so if we met again in Toronto it would simply be a continuing of this meeting in the same province. We had three meetings in Quebec last year. If the Ontario association were to hold its meeting in December or January we would have ample time to send out notices for our meeting, and to send out the necessary notices for the amendment of the by-laws. The matter might be left with the president in the meantime, as suggested by Mr. Jordan, to call the meeting at whatever place may be convenient.

President: Inasmuch as the last meeting was held in Quebec, or rather, inasmuch as the last three meetings really were held in Quebec, I would be in favor of meeting in Toronto, if it can be arranged that we will have time to do things regularly before the Ontario association meets.

Mr. Wickson: I will take it up with the president of the Ontario association, and will keep Mr. Chausse informed.

President: This completes our business for the morning, so far as our programme is concerned. There are, however, certain papers which have been prepared for presentation at this meeting. It is still early, and perhaps it would be as well for us to have the reading of one or two of these papers, and a discussion following. Mr. Hynes, of Toronto, has been good enough to prepare a paper on the question of the practice of technical professions in Canada being regulated by law. He has not found it possible to be with us at this meeting, and I would, therefore, ask Mr. Wickson to read Mr. Hynes' paper.

MR. HYNES' PAPER.

The morning session was concluded by the presentation of a paper on "Why the Practice of Technical Professions in Canada Should be Regulated by Law," by Mr. J. P. Hynes, of Toronto, and which, in the absence of the latter, was read by Mr. Wickson. Owing to lack of space in this number, this paper, which deals most interestingly with a highly important subject, will be published in the next issue of "Construction," together with the discussion it provoked, and which aroused a lively interest on the part of those who were present.

AFTERNOON SESSION.

At the opening of the afternoon session, called at 2.30 p.m., two papers, "Professional Ethics," by Mr. W. A. Langton, and "The Development of Architectural Design in Canada," by Mr. Chapman, were read in the absence of their authors. Both of those papers, which were ably presented and well received, are published elsewhere in this issue of "Construction," and deal with their subjects in a manner which entitles them to the earnest consideration of all members of the profession.

Following the reading of the above papers, Mr. Chausse, Secretary, referred to the payment of the expenses of the delegates who attended the Council meeting held here in April. There was a motion passed at that meeting authorizing the Treasurer to pay the accounts, but he thought he could not do so, because there was a resolution of another meeting which authorized him only to pay the expenses of the officials.

Mr. Jordan: The matter of meeting these expenses is one which will have to be taken up at the first opportunity when we have a meeting which can legally transact business.

Mr. Chausse: These accounts will simply have to stand over until we can get a quorum.

Mr. Jordan: I suppose this could be handled by correspondence. There is a provision in the by-laws enabling us to carry on some of our affairs by correspondence.

Mr. Chausse: The position is rather peculiar in regard to these accounts. The Council authorized their payment, but the Treasurer did not pay them. There was a motion passed in Quebec authorizing the Treasurer to pay the travelling expenses of the officials attending Council meetings and this Annual Convention. At the meeting held here there was another motion passed authorizing him to pay the expenses of all those attending. This was one of the biggest Council meetings we ever had, there were nine members present.

Mr. Jordan: As I understand it at the present time, we have not any Treasurer to sign the cheques, so we could not put a cheque through in any event.

Mr. Chausse: We have accounts on hand which we are obliged to pay. It occurred to me that some arrangement might be suggested here to-day and communicated to the Council, and if the majority assent, it might hold until we have a meeting. This is covered by section 27 of the by-laws. Of course, there is another difficulty, the present Council is practically out of office now, because we have a list of delegates for the coming year. At the same time, the new Council could be communicated with, and could decide about the elections.

Mr. Jordan: I think the only way would be to send a communication and have one delegate from each Province vote on the question by correspondence. At the present time I do not see that we can do anything but keep the money until we elect a Treasurer by correspondence in order to pay our bills. When the new Treasurer comes into office, there is no reason why he should not pay the bills according to the orders issued last year, if he is satisfied the records give him authority. If the resolution was passed, that is as good an order as he could possibly get. Of course, as Mr. Chausse says, no one can sign as Treasurer now, and the bank could not pay a cheque until we elect a Treasurer.

Mr. Wickson: Section 22 of the by-laws says: "The Honorary Treasurer shall have charge of the funds of the Institute, shall receive the money and pay all accounts approved of by the President or by the Chairman of the Finance Committee."

Mr. Chausse, in reply to an enquiry from Mr. Jordan, stated that the Finance Committee consisted of Messrs. Burke, Horwood and Watts. At the last Quebec meeting the Council authorized the Treasurer to pay certain accounts in connection with the rent, convention expenses, and so on. These were paid without being referred to the Finance Committee. Of course, the Council had more authority than the Finance Committee.

Mr. Jordan: Naturally, what the Council does takes precedence over everything. Might I ask if cheques are paid by the bank on the Treasurer's signature alone?

Mr. Chausse: Yes. Section 22 says that accounts exceeding ten dollars shall be paid by cheque signed by the Honorary Treasurer.

Mr. Wickson: Some organizations have them signed by the President and Treasurer.

Mr. Chausse: And I think all cheques should be signed by the President and the Treasurer.

Mr. Jordan: I think the Treasurer should be bonded for a sufficient amount, the expense of the bond to be borne by the Institute. This is only a matter of good business, especially if he is the only one who signs the cheques. Every organization does it, and my idea is that we should arrange for it before the new Treasurer is elected.

President: Whom would you suggest to the Council as Honorary Treasurer.

Mr. Chausse: Any of the delegates for next year would be eligible. The funds are in the Ottawa branch of the Bank of British North America.

Mr. Wickson: Did the Trustees of the Watts Estate turn the money over to you?

Mr. Chausse: No. It was a special account. The account is in the name of the Royal Architectural Institute, J. W. H. Watts, Honorary Treasurer.

Mr. Jordan: Although we cannot legally transact any business to-day, I have a few suggestions which I would like to leave with the Secretary to be taken up whenever there is a meeting which can deal with them. I do not know how they should be dealt with, but it seems to me they are matters which should be taken up.

First. I would suggest that before a new permanent treasurer is elected an arrangement shall be made for a bond for the treasurer, the expense thereof being paid by the R.A.I.C.

Second. That the travelling expenses of the president, secretary and treasurer be paid by the R.A.I.C. regularly. At the present time this cannot be done unless we pass a motion at each meeting, but, if we adopt a precedent, it becomes a matter of routine each time. I would also suggest that one-half the travelling expenses of the delegates from each province not represented by one of the above officers be paid by the R.A.I.C. That point has been brought up before. This money comes out of the funds which the provinces contribute, and I think if the institute paid one-half of the delegates' expenses it would encourage attendance.

Third. That the election of officers and the admission of the British Columbia Institute of Architects be effected by correspondence, under the conditions provided by the council.

Fourth, that Mr. Chausse act as treasurer, without bond, until a permanent treasurer shall be elected.

Mr. Chausse: That would mean I would also keep the books, and if I receive any cheques I would deposit them in the bank?

Mr. Jordan: Exactly, and keep the records going until the permanent treasurer can step in and do it in the regular way.

Mr. Chausse: I suppose I might deposit the money in the Montreal branch of the bank?

Mr. Jordan: Yes; you would be responsible for it personally.

Fifth. That cash prizes of $100.00, $75.00 and $50.00 be offered in lieu of the gold, silver and bronze medals proposed, but that medals be struck off as soon as practicable, and awarded to such candidates as may prefer them.

Sixth. That the suit against the Dominion Government in connection with competition prizes be carried on at the expense of the R.A.I.C. as being a matter of sufficiently spread interest for all architects, instead of it being carried on by any one provincial association, and that the institute take the responsibility of seeing it through as a broad protection for all architects. This has not been brought up so far, but when the occasion occurs I would like to see it dealt with.

Seventh. That the R.A.I.C. offer its professional services to the Dominion Government for war purposes, as an organization. If this organization can be of any use to the Government in any department in the way of assisting in consultation or advice, or by way of allowing its machinery to be used in executive work of any kind as a matter of patriotism, we should place ourselves at the disposal of the Government.

Eighth. That the pro rata tax be renewed for next year at the rate of $2.00 for each member. This is a matter which has to be attended to each year.

These are simply suggestions, and if the council is able to have a meeting soon, they may be dealt with; or if it is thought advisable they may be settled by correspondence. At the present moment I simply leave them with the secretary for consideration.

I understand the secretary is preparing a roll of honor, and carrying it on?

Mr. Chausse: Yes. I have not received any names recently. I may say, however, that the publishers of "Construction" also have a list of their own, and I have given them mine. We wanted more details from the Saskatchewan association in regard to the grade of each man on active service, or what he was doing. They simply gave us the names. I wrote them asking for particulars, but did not get any answer. Then, I did not get any list from the Ontario association. "Construction" has a very complete list from Ontario, and I have given them the names I had, and both lists will appear in the coming issue of "Construction."

(Editor's note.—The list referred to has been omitted from this number owing to lack of space, but will be published in either the November or December issues of "Construction," and will include all names which are available up to the present time.)

Mr. Jordan: I understand you are just compiling it. Is it to be posted anywhere, or just put on the record of the institute?

Mr. Chausse: Just in the records of the institute. I understand "Construction" will publish a page with a note to the effect that the list is not complete, and if any architects or relatives of architects, have any further information to give it will be continued in another issue.

Mr. Jordan: It is rather counting upon the different provincial associations to send in the names of any of their members who may be on active service?

Mr. Chausse: Yes. Of course, it is rather difficult for us to get the information in any other way, because if a man has left no address the letter will simply be returned to us. We sent out circulars for this meeting, for instance, and about twenty-five could not be delivered, and have been returned to us. Many of these men may be at the front. This number of "Construction" will be sent to all the members of the institute, and the matter will be brought to their attention in that way. This will probably bring in more names, and complete the list.

Mr. Wrigley: I may say the present list comprises about one hundred and twenty-five names.

Mr. Chausse: Out of about seven hundred members.

Mr. Taylor: That is not only members of the institute, but members of the staffs as well?

Mr. Chausse: Yes.

This completed the business up for consideration, and the meeting was then adjourned.

THE NEW CUNARD BUILDING AT LIVERPOOL.

The New Quebec Bridge

IN placing the large centre span of the Quebec Bridge in position, Canada has achieved her great engineering object, namely, the erection of the largest cantilever bridge ever built. According to a published report, the first train will pass over the structure at a very near date, and it will only be a short time after that before full traffic operations are assumed. The magnitude of the work has made the undertaking a focal point of the engineering world for many months past, and this was intensified by the general public interest which was aroused in the final stages of the work.

The suspended span, which is 640 feet in length, not only represents the largest span of its kind, but the first cantilever span ever lifted into position; and the operation of hoisting it into place by the use of hydraulic jacks is something which has previously never been attempted. Besides this, the structure incorporates a number of features in design and construction which are quite new in bridge engineering. Chiefly among these is the Johnson K-truss design, whereby the trusses are built in vertical planes and braced with diagonals only one-half the height of the posts. This has not only successfully solved many of the problems confronting those concerned in the erection of the bridge, but results in all diagonals having an uniformly regular slope at an angle of 45 degrees, which gives the bridge a most pleasing appearance.

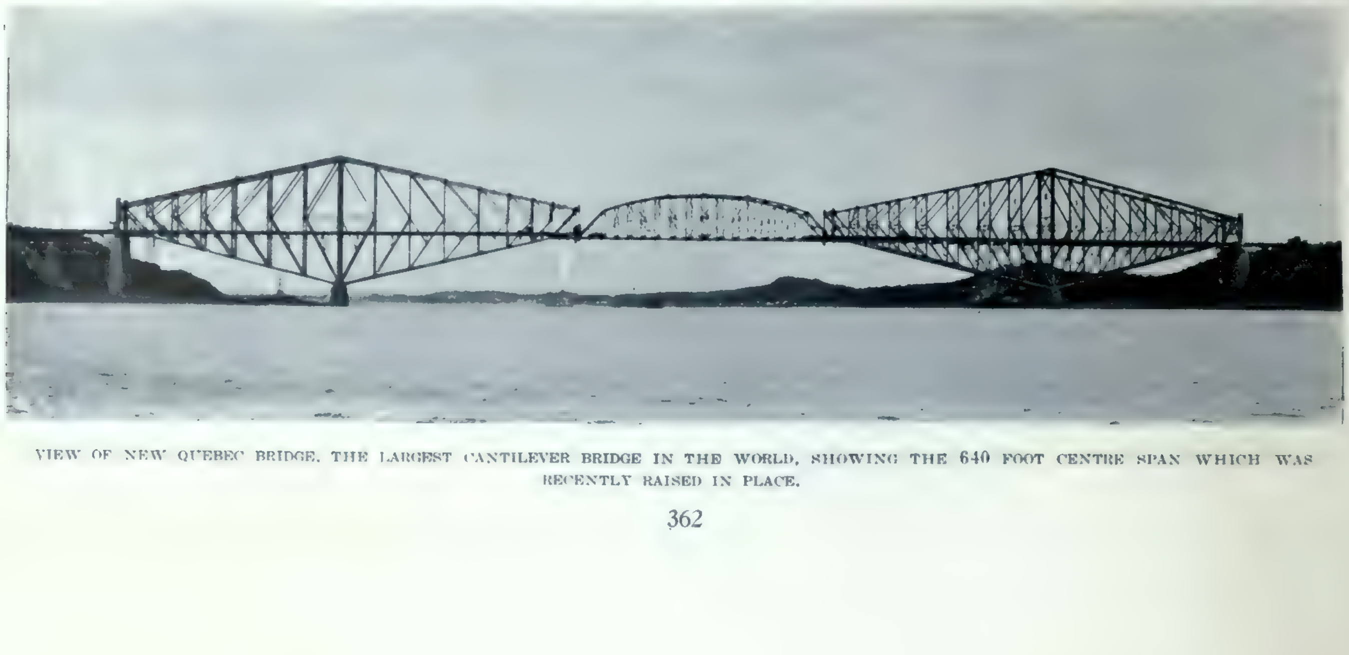
The principal dimensions of the bridge are: Length from shore to shore, 3,890 feet; width between buttresses, 1,800 feet; centre span, 640 feet; height of central span above river, 150 feet. Provision is made for two railway tracks, two street car tracks, and two roadways. The bridge has a channel span of ninety feet longer than the Forth Bridge, Scotland, which has previously held the world's record in that respect. The weight of steel in the bridge is 180,000,000 pounds, and the cost $17,000,000.

The method of towing the scows from Sillery Cove to the bridge position followed the same procedure as last year; eight powerful tugs being employed to manoeuvre and hold the span into position at its final site. After the span was securely moored in this position, the chains, made of a series of bar links, by which it was to be raised, were dropped into position and attached to the span and lifting operations started. The span was raised into position by 75 two-foot lifts, occupying four days' time.

Profiting by last year's disaster, a number of precautions were introduced to safeguard those engaged in the work, and no one was allowed on the span after it was once hitched up to the chains save the engineers who inspected the lifting connections from time to time. Last year the span was raised three feet at a time, but this year the engineers were satisfied with a two-foot elevation. After each hoist, the mooring trusses, which were ultimately to hold the span in place, were attached to the span to hold it until the jacks were readly for a new thrust. This was done to strengthen the support while the links of the chain were being taken out preparatory to the jack being hitched to those immediately beneath for a new raise.

A descriptive account of the lifting jacks and other equipment employed, together with various features of the bridge, was published in the September, 1916, issue of CONSTRUCTION.

The bridge is primarily to carry the Transcontinental railway between the Atlantic and Pacific; but will also be used by the C.P.R., G.T.R., Quebec Central, and a number of other railways. It is certainly a splendid tribute to Canadian engineering genius, and to those who were associated in the work either in the capacity of consultants or otherwise, great credit is due, and their accomplishment altogether minimizes any previous mishap in carrying out this great undertaking.



VIEW OF NEW QUEBEC BRIDGE, THE LARGEST CANTILEVER BRIDGE IN THE WORLD, SHOWING THE 640 FOOT CENTRE SPAN WHICH WAS RECENTLY RAISED IN PLACE.

CONSTRUCTION
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INTERESTS · OF · CANADA

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R. A. I. C. Meeting

No one with a knowledge of architectural affairs in Canada can fail to realize the importance of the subjects discussed at the Ottawa meeting of the Royal Architectural Institute of Canada. Perhaps the situation is best summarized in the remark ventured by Mr. Chapman in his carefully prepared paper to the effect that architecture in Canada is at the cross-roads; and in answer to his question as to whether we will go steadily forward in the great building expansion that is bound to come sooner or later, or blunder along in the mediocre way, much will depend on just how the present needs of the profession are met and considered. In other words, changing circumstances have brought conditions both competitive and otherwise which demand the attention of the profession individually and collectively, if the more worthy objects governing the art and business side of architecture is to be attained.

This not only implies the need of effective association work on the part of all affiliated bodies, but also requires that the business side of architecture must be placed on a highly organized plane in order to successfully meet present economic conditions. In view of these circumstances, it seems rather unfortunate that the meeting of the Institute was not sufficiently attended to form a necessary quorum. It would indeed be gratifying to see a return to the active interest of a few years back such as led to a spirit of more or less controversy and discussion when architectural education and legislation were formidable topics. Perhaps the suggestion that the Institute should meet in the future when one of the Provincial bodies is in session, will help matters in this direction. The small attendance can probably be laid to the disorganizing influences brought on by the war, and not, it is to be hoped, to the lack of interest on the part of those who are principally concerned. Even in England, which is more directly involved by the war than we are in Canada, the architects are by no means neglecting questions which will have a bearing on the future of the profession; and we in this country should at least show a corresponding activity. In fact the present should be a good time to take up these questions seriously with a view to formulating a constructive policy that will attain the objects desired.

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Material Market in British Columbia

The building material market in British Columbia, which suffered a curtailment as a result of the war, will now be benefited through the same agency (at least as far as lumber, steel and basic materials are concerned) as a result of the shipbuilding programme, which provides for the construction of ships totalling one hundred and seventeen thousand gross tons. The value of these ships, some fifty in all, according to the "Province" of Vancouver, is about $25,000,000. While this estimate of construction of tonnage is only approximate, it includes practically every ship of importance in freight carrying. There are, however, a number of small ships being built, such as fishing boats, which have not been included. Some of these ships are already in the water, some scarcely begun, but the amount of tonnage given represents definite contracts only.

Shipbuilding, in a word, promises to become a much more important industry in Canada than ever before, and the Pacific Coast is a district which is sure to be benefited. It will mean the employment of a large number of men, and result in the circulation of wages, which is bound to stimulate activities in other lines.

Canadian Building and Construction News

BUSINESS BUILDINGS.

Hamilton, Ont.—Armour & Company are erecting a three storey office building, on Wentworth street. Piggott & Healey have the general contract. Cost, $10,000.

London, Ont.—Work has started on a store building and garage, to cost $15,000, to be built on Dundas street, by Robt Slater, 203 Wortley avenue. W. G. Murray, Dominion Savings Building, is the architect, and L. H. Martin, 807 Princess avenue, is the general contractor.

Niagara Falls, Ont.—Architect J. Upper Collins, 49 Benson street, has awarded the following contracts for a brick drug store and office building, to be built on Queen street, for E. C. McNally, Welland avenue.; mason, W. Howlett, 5th avenue; carpenter, Wm. Hodgkins.

Ottawa, Ont.—Alex. Christie & Sons, 359 Elgin street, have the general contract for remodelling former Grand Union Hotel into modern offices. Taylor & Horwood, Castle Building, are the architects. Cost, $40,000.

Ottawa, Ont.—Architects Millson & Burgess, Union Bank Building, have complete plans for a $65,000 reinforced office building, to be erected on Sparks street, for R. L. Blackburn, Union Bank Building. Excavation operations have been finished.

Ottawa, Ont.—Architect J. E. Ewart, Booth Building, has awarded the following contracts in connection with the new store addition, to cost $45,000, which is being built by A. J. Freiman, 23 Rideau street; painting and glazing, Geo. Higman and Sons, 188 Rideau street; plumbing, W. G. Edge, Booth building.

St. Thomas, Ont.—Work has been started on the erection of a new building, at St. Thomas, for the Canadian Bank of Commerce. A. E. Ponsford Limited, St. Thomas, has the general contract.

Toronto.—Architect W. G. Hunt, Confederation Life Building, has completed plans for double stores and apartments, to be erected at the corner of Queen and Neville Park boulevard, for E Gagnon, 2359 Queen street E. Cost, $8,000.

Windsor, Ont.—The building owned by A. G. & W. E. Bellinger, 20 Ouellette avenue, and occupied as store and offices has been heavily damaged by fire. Total loss, including contents, $35,000.

CIVIL ENGINEERING.

Locus Hill, Ont.—The York Highway Commissioners are erecting a bridge over the Rouge River, to cost $7,200, and have awarded the general contract to the Lewis Construction Company.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Arnprior, Ont.—The Campbell House, of which G. Lodge is lessee, has been damaged by fire to the extent of $4,000. Insured.

Kingston, Ont.—McElroy & Birch have been awarded the contract for plumbing and heating, etc., in connection with the improvements which are being made to the Sir Oliver Mowat Sanitarium. The improvements will include the installation of fire mains, heating mains, and plant work.

Lindsay, Ont.—Plans have been completed by Architects G. M. Miller & Company., 93 Yonge street, for improvements to the Benson House, Burns & Lorengan, lessees. Work will consist of erecting an addition to kitchen and billiard room with guest rooms above. The sum of $8,000 will be expended, of which $4,000 will represent new plumbing work and equipment. Four billiard tables will also be installed. The general contractor is M. McGeough, Lindsay.

Renfrew, Ont.—The plumbing and heating contract for the new $30,000 addition now being built to the Renfrew Hotel, has been awarded to John Conley & Company. Work will consist of vapor steam heating system and installation of twelve complete bathrooms. Cost, $7,000. Architect W. E. Noffke, Central Chambers, Ottawa.

Ottawa, Ont.—Tenders have closed for changes in heating system and alterations to building in connection with the Isolation Hospital, according to plans prepared by W. E. Noffke, Central Chambers.

Toronto.—The following additional contracts have been awarded in connection with the Women's College Hospital and Dispensary, 125 Rusholme road: painting, Bavington Bros., 44 Glenlake avenue; dumb waiters, Turnbull Elevator Company, 126 John street.

PLANTS, FACTORIES AND WAREHOUSES.

Brantford, Ont.—Architect W. C. Tilley, Temple Building, has closed tenders for a two-storey brick factory, 65 x 130, for the Kitchen Overall and Shirt Company. Cost, $25,000.

Dundas, Ont.—The Pratt & Whitney Company of Canada, Limited, will erect a factory at Dundas, to cost $200,000, and their architects, Harris & Richards, Philadelphia, Pa., have awarded the general contract to P. H. Secord & Sons, Brantford, Ont.

Hamilton, Ont.—Piggott & Healey, 36 James street S., have the contract for erecting a three storey ice manufacturing plan for Armour & Company. Cost, $40,000. Operations have commenced.

Hamilton, Ont.—Work is underway towards the erection of an $8,000 factory addition, for Fearman Bros., McNab street. McPhie & Kelly, Bank of Hamilton Building, are the architects, and Isbister Bros., 142 Emerald street S., the general contractors.

Hamilton, Ont.—Architects McPhie & Kelly, Bank of Hamilton Building, have awarded the contract for a brick addition, to be built to the factory of the Canadian Fasteners Limited, Main street. The Frid Construction Company is doing the work and operations are now underway. Cost, $20,000.

Hamilton, Ont.—Work has been started on the new three storey, brick and reinforced concrete wire mill, to be built by the Steel Company of Canada, on Wellington street. G. J. Hutton, Bank of Hamilton Building, is the Architect, and W. H. Yeates, 24 Leeming street, is the general contractor. Cost $75,000.

Hamilton, Ont.—The following additional contracts have been awarded in connection with $75,000 factory addition, now being built for the American Car Company, Emerald and Shaw streets: Sheet Metal, Denis Jocyln, 13 Walnut street; roofing, Bird & Son, 70 King street E.; plumbing, Adam Clark, 7 Main street W.; painting and glazing, P. Thompson, 13 Walnut street. W. H. Cooper, Clyde Building, is general contractor.

London, Ont.—Architects Watt & Blackwell, Bank of Toronto Building, are preparing plans for a factory for the London Art Woodwork Company, Dundas street, to cost $25,000.

London, Ont.—The London Art Woodwork Company, Dundas street, intends to erect a two storey reinforced concrete building. Tenders have been received but no contracts have been awarded as yet. Watt & Blackwell, Bank of Toronto Building, are the architects.

Owen Sound, Ont.—John A. Cole, Owen Sound, will submit a by-law to the ratepayers for the loan of $75,000 for the erection of a factory for manufacturing metal products, to cost $100,000.

Owen Sound, Ont.—The Keenan Woodenware Manufacturing Company are erecting a three storey, 135 x 63, brick and mill factory, according to plans prepared by architects Forester & Clarke. Cost, $15,000. James Grier & Campbell, Owen Sound, are the contractors.

Peterboro, Ont.—B. F. Ackerman, Son & Company are equipping part of present factory (8,000 square feet) for the manufacture of boots and shoes. It is the intention to build an addition at some future date.

Sault Ste. Marie, Ont.—The International Paper Mill Company is contemplating the erection of a $250,000 paper and pulp plant.

Tilbury, Ont.—The Hessco Electric Company intends to erect an $80,000 plant on Louis street, to comprise a three storey building, 200 x 50, and a two storey building, 100 x 50. The structures will be of reinforced concrete and modernly equipped.

Tillsonburg, Ont.—The Maple Leaf Harvest Tool Company, Tillsonburg, are erecting a factory to cost $50,000, and have awarded the general contract to A. E. Ponsford, St. Thomas, Ont.

Toronto.—The Willys-Overland Limited, Weston road, are building a $7,500 addition to their shop. The Crescent Concrete Company, Temple Building, are the general contractors.

Toronto.—The T. Eaton Company, Yonge and Queen streets, are negotiating to purchase a site on Coxwell avenue, now owned by city, with a view to erecting a warehouse, costing $65,000.

Toronto.—Foundation work has been started on a five storey factory to be erected on King street, near Spadina, for R. G. Long & Company, 730 King street W., to be of brick and mill construction, and to cost $40,000. Thos. Essery, Confederation Life Building, has the contract.

Toronto.—Architects Prack & Perrine, Lumsden Building, have awarded the following additional contracts in connection with the new $100,000 factory which is being built at Carlaw and Natalie streets, for the Palmolive Soap Company: heating and piping, A. Welch & Son, 304 Queen street W.; elevators, Otis-Fensom Elevator Company; electric wiring, E. F. Salisbury, 49 Wellington street E.

Toronto, Ont.—Work has commenced on a factory for the Liquid Air Company, 18 Doler avenue, to cost $20,000; R. H. Harman & Son, 248 Dupont street, has been awarded the mason contract. J. W. Woods, 39 Front street west, is erecting a warehouse on Pearl street, to cost $15,000, and his architect, J. L. Havill, Imperial Oil Building, has awarded the following contracts: metal sash, A. B. Ormsby Co., Ltd., 48 Abell street; plumbing and heating, Harry Hicks Co., 202 Church street. Drummond & McCall Company, 373 Front street east, have prepared plans for an addition to their warehouse on Front street east, to cost $12,000. The Canadian Hanson Van Winkle Company, 15 Morrow avenue, have prepared plans for an addition to their warehouse on Morrow avenue, to cost $7,000.

West Lorne, Ont.—Plans are being prepared for a $15,000 factory, to be erected by B. Weisbrood. Machinery will be purchased for textile manufacturing.

Woodstock, Ont.—The Woodstock Cotton Spinning Company are excavating for a factory, to cost $40,000: Bond & Lampman, Woodstock, have been awarded the general contract.

PUBLIC BUILDINGS.

New Liskeard, Ont.—The Provincial Department of Public Works has awarded the contract for a stock judging pavilion, to be built at New Liskeard, to Hill, Clarke, Francis Limited, a local firm.

Sarnia, Ont.—The ratepayers have voted in favor of a by-law authorizing an expenditure of $25,000 for the erection and equipment of an incinerator plant.

St. Catharines, Ont.—The Grand Trunk Railway have commenced work on a station at St. Catharines, to cost $25,000.

Ottawa, Ont.—The contract for enamelled brick, required in the erection of the new Parliament Buildings, has been awarded to Dartnell Limited, 8 Beaver Hall square, Montreal. J. W. McGuire Limited, 91 Jarvis street, Toronto, has been awarded the contract for the plumbing pipes and fixtures, which involve an expenditure of $129,000.

MISCELLANEOUS.

Amherstburg, Ont.—The Brunner Mond Company are preparing plans for a dock and wharf, to cost $50,000.

Aylmer, Ont.—The Carnation Milk Products Company, Limited, are preparing plans for a storage building. Work on this building will commence in November.

Chatham, Ont.—The Canadian Bank of Commerce is erecting a new building at the corner of King and Sixth streets. Mr. Horsburg, Dominion Realty Company, Toronto, is the architect, and the Dickie Construction Company, Ryrie Building, Toronto, are the general contractors.

Coniston, Ont.—The Mond Nickel Company, Coniston, are erecting a dry house, to cost $30,000, and their architect, W. L. Dethloff, has awarded the following contracts: Heating, Taylor-Forbes Co., Ltd., Guelph; plumbing, J. L. Mott Company, Ltd., 136 Bleury street, Montreal: septic tank, Kaustine Company, Limited, Toronto and Buffalo.

Fort William, Ont.—The Davidson-Smith Company, Grain Exchange Building, are excavating for a reinforced concrete elevator and feed mill, on Vickers street north, to cost $100,000; Barnet-McQueen, Cuthbertson Block, are their architects. Fegles-Bellowes, Grain Exchange Building, architects and general contractors, have commenced work on a reinforced concrete elevator for H. M. Patterson, Grain Exchange Building, to cost $200,000.

Hamilton, Ont.—An addition, costing $15,000, is being built to the shop of the T. H. & B. Railway. G. E. Mills, 614 King street E., is the general contractor.

Jordan Harbor, Ont.—The Provincial Department of Public Works has awarded to the Toms Contracting Company, Kent Building, Toronto, the contract for a new power house, at the Experimental Farm Station. The new building will be 75 x 37, tapestry brick and reinforced concrete construction with modern equipment throughout. This firm will also build the foundations for the proposed green house, regarding which the contract for the superstructure has been let to the Glass Garden Builders, Kent Building, Toronto.

London, Ont.—The Battle Creek Toasted Corn Flakes, Dundas street, contemplates the erection of a mill building, to cost $25,000.

London, Ont.—E. Leonard & Sons, York street, have received estimates for the erection of a two-storey, 180 x 50, reinforced concrete blacksmith's shop to cost $20,000.

London, Ont.—Architects Watt & Blackwell, Bank of Toronto Building, are preparing plans for the proposed soldiers' home, to be built for the local War Veterans Association. The building will cost $25,000.

London, Ont.—L. H. Martin, 807 Princess avenue, has the general contract for the erection of a brick store and garage, on Dundas street, for Ralph Slater, 203 Wortley avenue. Cost, $15,000. W. G. Murray, Dominion Savings Building, is the architect.

London, Ont.—Work has been started in connection with the new $100,000 factory addition, which the Battle Creek Toasted Corn Flakes Company is building on Dundas street, adjoining their present plant. Archibald & Holmes Limited, Excelsior Life Building, Toronto, are the general contractors.

New Toronto, Ont.—Work on the superstructure of the new $80,000 Hydro Sub Station, at the corner of Ninth street and Birmingham avenue, is progressing. It will be three storeys, 75 x 40, brick, steel and concrete. Witchall & Sons, 156 St. Helens avenue, have the general contract. Sub-contracts have been awarded as follows: steel work, McGregor & McIntyre, 1139 Shaw street; roofing, G. Duthie & Son, 30 Widmer street: painting, Taylor & Company; steel sash, Trussed Concrete Steel Company, 23 Jordan street; plumbing, Fiddes & Hogarth, 122 King street E.

Orillia, Ont.—Work has started on the new G. T. R. station, at Orillia. The structure will be one storey, 24 x 120, of brick construction and modern throughout. Cost, $15,000.

Smith Falls, Ont.—Tenders have been received for a new exchange building, to be erected for the Bell Telephone Company. Cost, $30,000.

Toronto.—Work has been started on a frame and galvanized iron addition to the fertilizer building of Gunns Limited, West Toronto. Cost, $10,000.

Toronto.—Plans have been completed by Architect J. L. Havill, 56 Church street, for a brick service station, to be erected at the corner of Yonge and Roxborough streets, for the Imperial Oil Company. Cost, $15,000.

Walkerville, Ont.—It is the intention of Hiram Walker & Sons Limited, to rebuild storage and dairy building, recently destroyed by fire at the Walkerside Dairy Farm. The new structure, which will probably not be erected until spring will cost $10,000.

Wallaceburg, Ont.—Plans have been prepared by L. C. McNeice, Town Engineer, for a two-storey building, to be erected for the Wallaceburg Hydro System. The structure will be used as an office and store room and cost $5,000.

Williamstown, Ont.—T. S. Hudson & Company, 42 St. Sacrament street, Montreal, has the general contract for building barn on the property of Col. D. M. Robertson, recently destroyed by fire. Structure will be concrete, frame and wood shingles, and cost, $15,000.

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RESIDENCES, ETC.

Hamilton, Ont.—Wood Brothers, Grosvenor avenue, have commenced work on a residence for Dr. G. Graham, Bartonville street, to cost $3,500. A. McMullen, 41 Kensington avenue, is excavating for a residence on Balmoral avenue, to cost $3,000. M. H. Kern is erecting a residence to cost $3,000, and has awarded the mason contract to N. Nashnan, York street, and the carpenter work contract to Carter & Hardy, 261 Holton avenue.

Toronto, Ont.—R. G. Furness, 34 Russett avenue, is excavating for a residence on Regal road, to cost $3,500. C. G. Ashley, Strathcona Apartments, has had plans prepared for a residence on Pote avenue, to cost $5,000. Thomas Frankish, Coleman, Ont., has had plans prepared for a residence on Golfview avenue, to cost $4,000. G. W. Wingate, 29 Wolfrey avenue, has had plans prepared for the erection of a residence and garage to be built on Heath street west, to cost $7,500. J. N. Walkley, 326 Shaw street, has prepared plans for three residences on Edna avenue, to cost $9,000.

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SCHOOLS AND CHURCHES.

Brantford, Ont.—The Board of Education has been investigating sites for the erection of a technical high school and also a grade school.

Highland Creek, Ont.—Scarboro Township Council has authorized School Section No. 7, Highland Creek, to issue debentures to provide a new two-roomed school, to cost $10,000.

London, Ont.—Plans have been completed by Architects Watt and Blackwell, Bank of Toronto, Building, for a school, to be erected on Ottawa avenue, for the Military Hospitals Commission. Cost, $10,000.

London, Ont.—L. H. Martin, 807 Princess avenue, has been awarded the general contract for the erection of a school, at Manor Park, for the Trustees of Westminster Township. Cost, $7,000. W. G. Murray, Dominion Savings Building, is the architect.

South Osgoode, Ont.—Tenders have just closed for a stone church, costing $20,000, to be built for St. John's Congregation. Rev. Father F. Corkery, pastor. Millson & Burgess, Union Bank Building, Ottawa, are the architects.

Toronto.—Work has been started on a two-roomed school to be erected on Close avenue, for the Separate School Board, according to plans prepared by Architect C. J. Read, Confederation Life Building. The contractors are: mason, John McGlue, 285 Sherbourne street; steel work, McGregor & McIntyre, 1139 Shaw street; carpenter work, E. & M. J. Madden, 552 Adelaide street W.; roofing, E. F. Watson, 99 Beaconsfield avenue: painting, T. J. Phelan, 133 Queen street W.; plastering, W. J. Porter, 105 Balliol street; plumbing and heating, T. E. Regan, 95 Boon avenue.

Weston, Ont.—The Public School Board is discussing the advisability of purchasing a site and erecting a new building to relieve overcrowded conditions.

CATALOGUES and BOOKLETS

Refrigerators for Institutions.—The Eureka Refrigerator Company, Toronto, in their twenty-eighth annual catalogue, describe the construction of refrigerators for hotels, hospitals and institutions. A copy will be sent to any architect on request.

"Creo-Dipt" Shingles.—The Standard Stained Shingle Co., North Tonawanda, N. Y., have several folders in circulation setting forth the merits of creosoted stained shingles and the various shapes, grades, sizes and shades in which they are supplied. A series of photographic prints showing applications of "Creo-Dipt" shingles for various effects on walls and roofs, is also a feature of their publicity campaign, of unquestionable interest to designers of bungalow types.

Hospital Signal Systems.—Architects interested in the construction of public buildings and appliances for their requirements, will want to see a booklet issued by The Holtzer-Cabot Electric Co., Boston, Mass., covering the hospital signal apparatus of their manufacture. Several applications of the system are described, and lamps, semaphores, buzzers and annunciators to fit the variations of the signaling principle are shown. Floor plans, wiring diagrams and photographic reproductions of hospital buildings in which Holtzer-Cabot signal installations have been made illustrate the booklet.

Elevator Door Hardware.—The September issue of "Door-Ways," house organ of the Richards-Wilcox Co., London, Ont., deals with the subject of the company's Ideal brand of elevator door hangers and door-closers. There is an article by a member of the sales organization, and a number of letters and photographs testifying to the satisfactory use of these products in large buildings are reproduced. Names of inquirers directly interested in buildings will be added to the mailing list of the company, to receive monthly issues of this publication and full advertising literature on the Ideal line.

Expanded Metal for Concrete Work.—Corr-Mesh, a stiff-ribbed diamond mesh expanded metal for concrete, plaster and general stucco work, is the subject of a catalogue just issued by the Corrugated Bar Company, Mutual Life Building, Buffalo, N.Y., represented in Canada by Frederick Reed, 110 Church street, Toronto. The forepart of the catalogue is devoted to a detailed description of the material, its advantages and applications. Then follow designing tables, graphic construction details, and specifications relating to Corr-Mesh uses in partitions, walls, floors, roofs and ceilings respectively. Construction photographs are scattered throughout the catalogue in pleasing effect.

Vapor Heating System.—A carefully printed and well illustrated twelve-page booklet has been issued by the C. A. Dunham Company of Toronto, dealing interestingly with the Dunham system of vapor heating. It takes up in comparative order the various types of heating, with their merits and defects, and explains the seven units of the Dunham system. These include the Dunham radiator trap, packless inlet valve, air eliminator, pressurestat, thermostat, check damper and Dunham's damper motor, all of which are described in detail. The booklet contains a pocket or envelope at the back, so that the architect and others can keep all literature and data received from the company at subsequent dates intact.

Air Washers.—An interesting advertising novelty has recently been mailed out by the Carrier Air Conditioning Company, Buffalo, N. Y. It consists of a folding post card so cut and arranged that when the folds are laid back it gives a very thorough photographic explanation of the company's well known air washing system as completely installed. The company's product represents a specialized type of air washer adaptable to schools, office buildings, factories and other types of buildings in which a large number of people gather or are employed. It produces a uniformly atomized spray which thoroughly mixes and wets down the air, and claims a number of other individual features in design and construction.

Wrought Iron Piping Service Records.—Service claims for wrought iron pipe in plumbing, heating and power systems, are supported by citations of actual long and continued satisfaction, in a booklet circulated by the A. M. Byers Company, of Pittsburgh, Pa. This little publication is "an illustrated record of the service given by Byers pipe installed from twenty-five to forty years ago." The pictures show thirty-odd familiar industrial and office buildings, hospitals, hotels and municipal structures, each bearing a caption giving the date of installation of wrought iron piping for specific purposes and testimonials of its endurance. The booklet should be valuable to architects specializing in this type of building construction.

Small Cold Storage Buildings.—The Dominion Department of Agriculture has issued Bulletin No. 49, of the Dairy and Cold Storage Branch, entitled "Small Cold Storages and Dairy Buildings," the immediate sponsors for which are Mr. J. A. Ruddick, Dairy and Cold Storage Commissioner, and Mr. Joseph Burgess, Cold Storage Inspector. The bulletin describes cold storage construction of a comparatively simple and inexpensive kind. Besides explanatory details of plans and material required for construction of ice houses and refrigerators, a series of drawings prepared by the architect's branch of the Department of Public Works is presented, of which blue prints on a scale of one inch to two feet can be had free on application to the Dairy and Cold Storage Commissioner, while the bulletin itself can be had, also free, by writing to the Publications Branch, Department of Agriculture, Ottawa. Five different plans are given in the bulletin, with complete specifications for each and a statement of quantities of ice that can be stored.

"Good Lighting is Clear Profit."—The present tendency in factory and office-building construction proves that architects realize the value of good arrangement, satisfactory ventilation and scientific lighting, as they affect efficiency.

Probably the most important consideration in manufacturing buildings is the natural and artificial lighting facilities. Sufficient light, well diffused, will correct the time waste, errors and accidents of the dimly illumined or the improperly lighted building. Glare will cause eye-strain as surely as will a poorly lighted interior. And eye-strain affects the health of the workman and detracts from his accuracy and speed and has therefore a direct influence on the product.

These facts are emphasized and a remedy provided in a booklet published by the National X-Ray Reflector Co., Chicago, which gives details of increased production in fifty instances where systems of properly diffused lighting were installed in factories and offices.

There is also an interesting chapter on flood lighting for night construction work, advertising purposes or the always present necessity for protection against prowlers.

The book is illustrated with reproductions developing its arguments, sound logic of interest to the architect of any type of construction where the problems of either natural or artificial lighting become of unusual importance.

Electrical Specialties. The new general supply catalogue, just issued by the Northern Electric Company, is one of the largest electrical catalogues as yet printed, containing no less than 1,485 pages and weighing 6½ pounds ready for mailing. It gives a most complete listing of up-to-date electrical specialties of every description, classified in twenty-two sections, each section commencing with a four-page colored insert printed on heavy coated paper. The catalogue introduces many innovations over previous issues, the most important of which is the method provided wherever practicable, whereby prices f.o.b. Halifax, Montreal, Toronto, Winnipeg, Calgary and Vancouver can quickly and easily be obtained. Heretofore electrical supply catalogues have given only the manufacturers' list prices and discounts, usually making it necessary for the purchaser to estimate his own freight (or freight and duty), where costs were required f.o.b. various destinations. In their new catalogue the company has taken care of these two very important elements entering into the cost of electrical supplies delivered to Canadian points. Montreal and Toronto are used as basing points and the list prices found in the catalogue apply to goods sold f.o.b. at these two places, except as otherwise noted. For other points where the company has warehouses, the approximate delivered prices can be obtained by adding to the list prices shown, the necessary percentage, as explained in foot note on each page.

◆

MAY NEED TWO BILLION FEET OF LUMBER FOR WAR.

Estimates prepared by the Lumber Committee of the Advisory Commission of the Council of National Defense of the United States show that 2,000,000,000 ft. may be used for purposes directly connected with the war in the next twelve months. Construction of the sixteen cantonments which will house the new army will absorb a large amount of the Government's lumber purchases. The cantonments will require about 500,000,000 ft. Second in quantity of lumber required comes the wooden ship-building programme, now estimated at 400,000,000 feet.

◆

CANADIAN WOODS FOR STRUCTURAL TIMBERS.

Too many Canadians in the past have been prone to think that what comes from abroad is better than what is produced at home. Largely because of this idea imported timber has been used in buildings on the edge of our timber lands. The Forest Products Laboratories of Canada, under the Forestry Branch of the Department of the Interior, have been investigating this question and have found that some of our Canadian timbers are superior to those imported, and just as cheap, or cheaper. This means much to us in war time, when every dollar produced or saved makes it by so much the easier to win the war. The results of this investigation have been published in Forestry Branch Bulletin No. 59, entitled "Canadian Woods for Structural Timbers." Lumbermen, builders, manufacturers, or others interested who have not yet received a copy may obtain one free on application to the Director of Forestry, Ottawa.

◆

FRANCE TO BUILD HER OWN HOUSES.

The annual review of the work of the Canadian Commercial Intelligence Service has recently been issued. The report contains a few matters of interest to contractors. In regard to the portable house industry and trade it states that six models of portable houses were sent to Paris about midsummer of last year and were set up in the Tuilleries Gardens, a short time after the opening of the Reconstruction Exhibition held there. Mr. Frank Pauze, of Montreal, a member of the Canadian Trade Commission which visited France, furnished valuable information to several builders who made enquiries regarding portable houses. The six model houses were presented to the "Secours National," and are being utilized by the Canadian General Hospital No. 8, at St. Cloud. It was ascertained, the report says, that the policy adopted by the French authorities would be that the construction of houses for the devastated regions should be undertaken as much as possible in France.

◆

PROGRESS OF THE PULPWOOD INDUSTRY.

The war, with its changes in trade routes and markets, has tended to greatly increase the pulpwood and pulp industry in Canada in the last three years. In fact, the industry has grown steadily since its inception. These facts are shown in a bulletin just issued by the Forestry Branch of the Department of the Interior. The total value of the pulpwood made into pulp in Canada and exported in the raw state for manufacture abroad was nearly $20,000,000. The amount of pulpwood made into pulp in Canada was 1,764,912 cords, an increase of about 300,000 cords over 1915. While over a million cords of wood were exported in the raw state for manufacture abroad, this was lower in proportion to the total pulpwood made into pulp in Canada than ever before, showing that the Canadian manufacturers are working up more and more of this raw material in our own country. The statistics of the industry are set out in Bulletin 62B, Pulpwood, 1916, which may be had free by application to the Director of Forestry, Ottawa.

◆

CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

Administration Building, National Sanitarium Association, Toronto.

Boilers, Dominion Radiator Co.
Brick, Fiske & Co.
Brick Work, Teagle & Son.
Cabinet and Woodwork, Thos. Painter & Son.
Electric Fixtures, McDonald & Wilson.
Electric Wiring and Apparatus, McDonald & Wilson.
Elevators and Hoists, Otis-Fensom Elevator Co.
Expanded Metal, Pedlar People.
Fire Escapes, McGregor & McIntyre.
Flooring, Marble, Gibson Marble Co.
Furniture, Macey Furniture Co.
Hardware, Jobbers, Aikenhead Hardware Co.
Hardware, Yale & Towne.
Heating, Purdy, Mansell, Ltd.
Hollow Tile, Don Valley Brick Works.
Interior Painting, McCausland & Son.
Marble, Gibson Marble Co. and Vermont Marble Co.
Ornamental Iron, McGregor & McIntyre.
Paints, Pratt & Lambert.
Plumbing Fixtures, James Robertson Co.
Pumps, Purdy, Mansell, Ltd.
Plaster, R. C. Dancy.
Radiators, Gurney Foundry Co.
Roofing, Geo. W. Bryan.
Stone, Indiana Quarries Co.
Stone Work, Nicholson & Curtis.
Structural Steel, McGregor & McIntyre.
Tile, T. Eaton Co.
Terra Cotta, Northwestern Terra Cotta Co.
Vaults, J. & J. Taylor.
Vacuum Traps, C. A. Dunham Co.

Registry Building, Toronto.

Boilers, John Inglis & Sons Co.
Brick, Don Valley Brick Works.
Cabinet and Woodwork, J. A. Berridge.
Carpets and Rugs, Murray-Kay, Ltd.
Concrete Work, James A. Wickett, Ltd.
Electric Fixtures, Robt. Simpson Co., Ltd.
Electric Globes and Glassware, Robt. Simpson Co., Ltd.; MacBeth-Evans.
Electric Wiring and Apparatus, Fred Armstrong Co., Ltd.
Elevators and Hoists, Turnbull Elevator Co., Ltd.
Expanded Metal, Pedlar People, Ltd.
Fire Doors, A. B. Ormsby, Ltd.
Fire Hose, Goodyear Tire & Rubber Co.
Fittings, Office Specialty Co.
Flooring, Marble, Missisquoi Marbles, Ltd.
Furniture, G. N. Reynolds & Co.
Grilles, Tuttle & Bailey.
Hardware, Jobbers, Aikenhead Hardware Co.
Hardware, Yale & Towne.
Heating, Jos. McAlear and M. F. Thomas.
Hollow Tile, Don Valley Brick Works.
Interior Fittings, Cabinet, Decoration, Hughes & Co.
Marble, Missisquoi Marbles, Ltd.
Metal Door and Window Trim, Henry Hope & Sons.
Metal Lath, Pedlar People, Ltd.
Ornamental Iron, Geo. B. Meadows Co., Ltd.
Paints, Pratt & Lambert.
Plumbing Fixtures, Cluff Bros.
Plumbing, Purdy, Mansell, Ltd.
Plaster Work, W. J. Hynes, Ltd.
Radiators, Dominion Radiator Co.
Roofing, Paterson Mfg. Co. (Barrett Specification).
Steel Equipment, Office Specialty.
Stokers, Burke Furnace Co.
Stone, Geo. Oakley & Son.
Structural Steel, Toronto Structural Steel Co.
Structural Engineer, E. J. Smith.
Tanks, John Inglis & Co.
Tile, Italian Mosaic & Tile Co.
Vacuum Traps, C. A. Dunham Co.
Ventilating System, Canadian Blower and Forge Co.

Transportation Building, Ottawa.

Boilers, Efficiency Boilers & Heating Co., Ltd.
Concrete Work, Norcross Bros.
Electric Fittings, U. E. Davis.
Electric Fixtures, Etc., Electric Repair Contracting Co.
Elevators and Hoists, A. B. See Elevator Co.
Flooring, Cement, Dartnell, Ltd.
Glass, Hobbs Mfg. Co.
Hardware, Russell & Erwin Co.
Mail Chute, Canadian Cutler Co.
Marble, Vermont Marble Co.
Mill Work, Geo. M. Mason; Estate Jos. Davidson.
Ornamental Iron, F. A. McKay.
Painting, G. T. Green.
Plumbing, McKinley & Northwood.
Plastering, Frank Hunt.
Roofing, Sheet Metal, MacFarlane Douglas, Ltd.
Stone, Granite James Brodie Sons.
Stone, Limestone, Hooper Bros.
Structural Steel, Dominion Bridge Co.
Tile, A. K. Mills & Son.
Terra Cotta, Atlantic Terra Cotta Co.
Ventilating, McKinley & Northwood.

CONSTRUCTION

November, 1917 Vol. 10, No. 11

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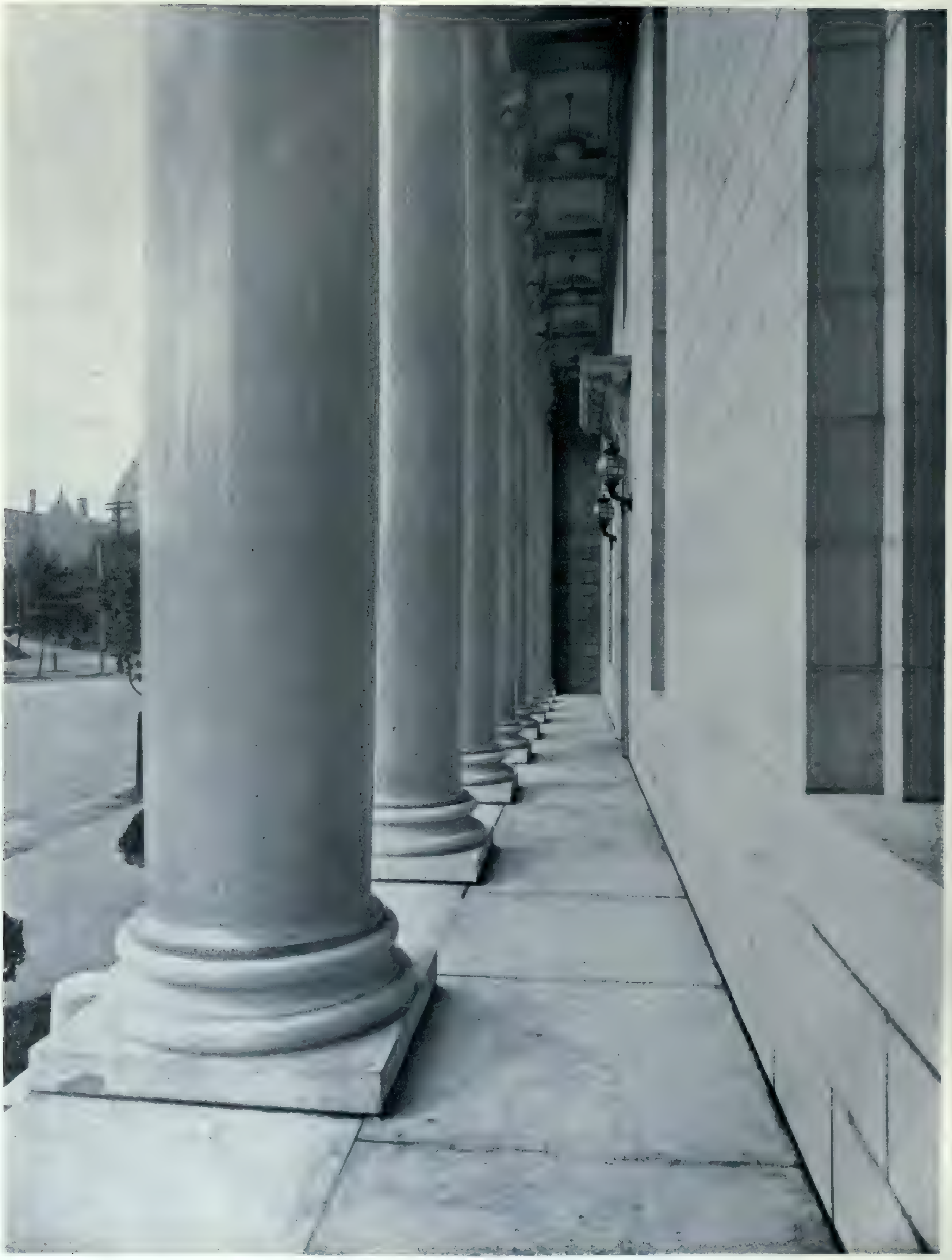
GRAPHIC ARTS BLDG., TORONTO, CANADA
BRANCH OFFICES
MONTREAL NEW YORK



PORTICO LOOKING EAST, MONTREAL PUBLIC LIBRARY. EUGENE PAYETTE, ARCHITECT.

Montreal Public Library

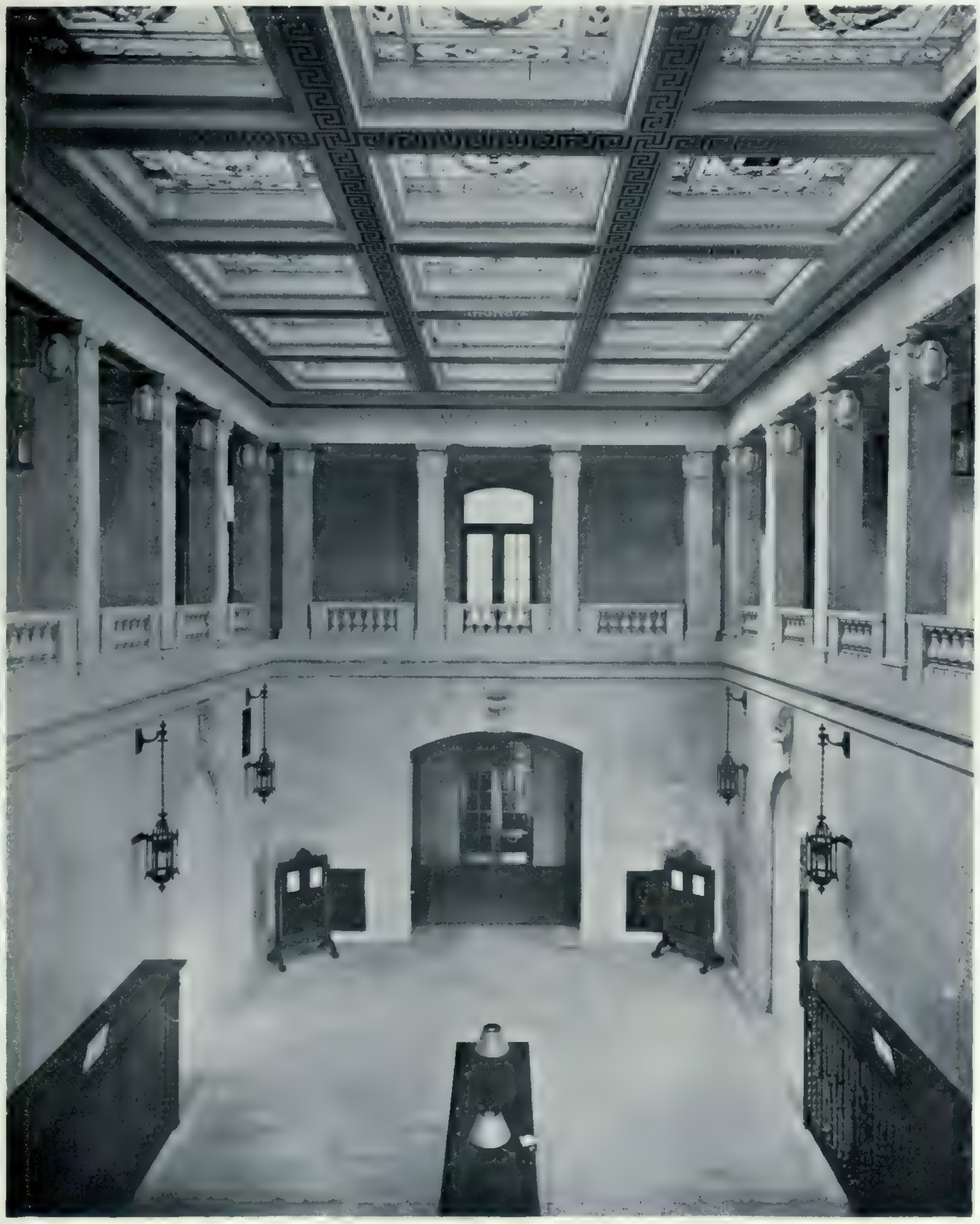
THE long contended question of a new public library in Montreal, which was settled when the City Council finally decided to utilize a plot of city land on East Sherbrooke Street, facing Lafontaine Park, has resulted in a completed building which successfully rewards the efforts of its promoters to provide an institution worthy of the civic importance of the large community which it serves.

Moreover the building represents the working out of an attractive scheme which takes into account two conditions not usually met with in the designing of public structures. As a rule buildings of this character are built on level grounds, but here the main street (Sherbrooke East), facing the park, is higher by eighteen feet than Montcalm and Beaudry Streets, on which the side and rear of the structure abut. It was necessary for the architect, Mr. Eugene Payette, to adjust the plan to this slope, in addition to conforming with an oblique street line extending across the front.

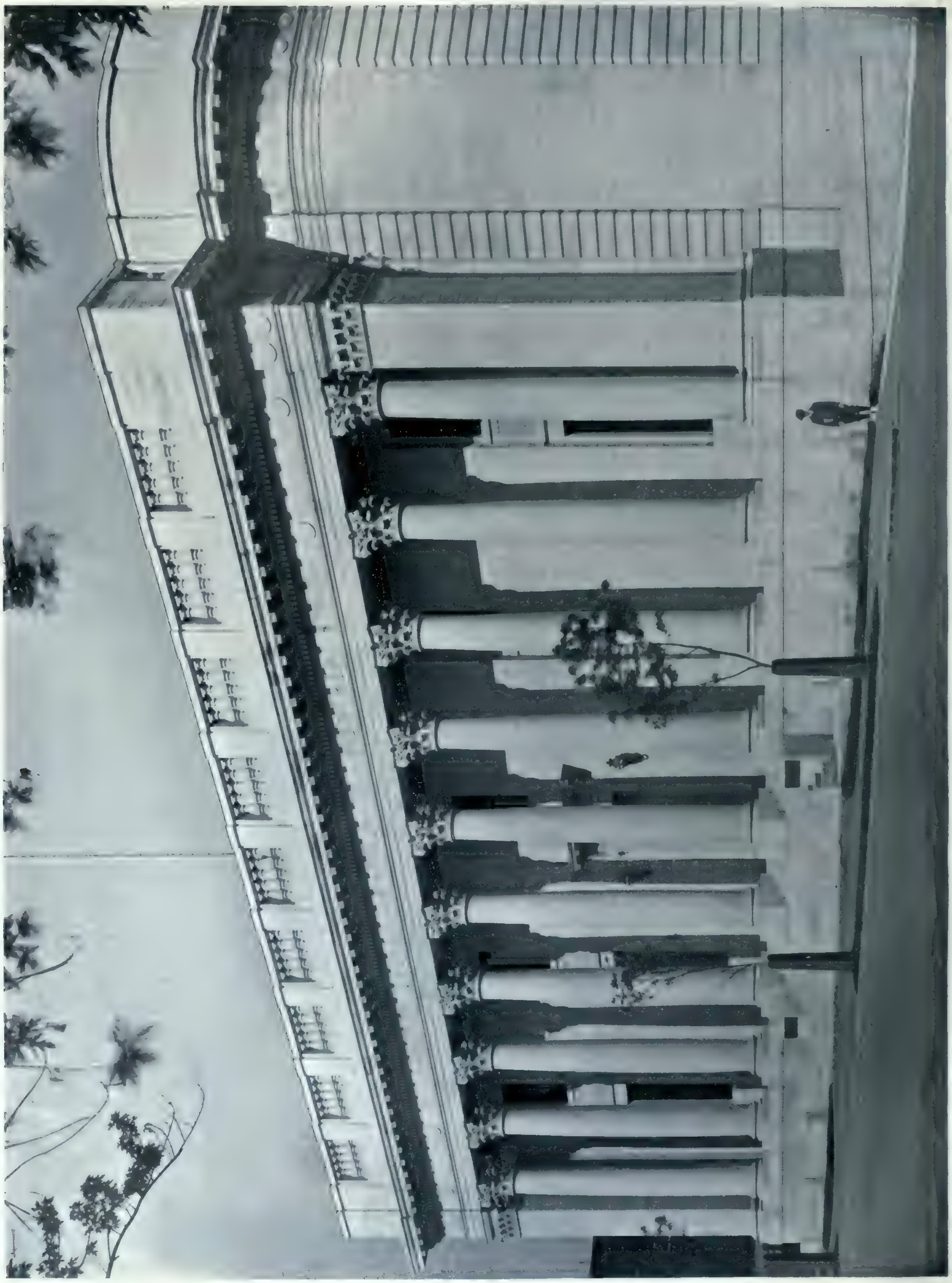
The degree to which these conditions have been satisfactorily met is indicated in the accompanying illustrations. The facade, with its Italian Renaissance character, is both imposing and interesting in its carefully worked out proportions, while the plan is well organized to successfully fulfill in every way the functions of an institution of its kind.

The dimensions of the main portion of the structure are 155 x 109 feet, and the height 58 feet. An extension to this of 109 x 45 feet and 56 feet high, is devoted to book stack purposes.

The children's reading room, which has its own individual entrance from Montcalm Street, is placed on the lower or basement floor level, thus doing away entirely with the necessity of its patrons coming in contact with the main portion of the library situated above. This department is conducted independent of the upper floors and is complete in itself. It has its own charging counter for the outside circulation of books, as well as direct access to the stack room for the attendants and separate lavatory conveniences. In addition this floor also includes the janitor's apartment, boiler room and lesser services; all principal rooms

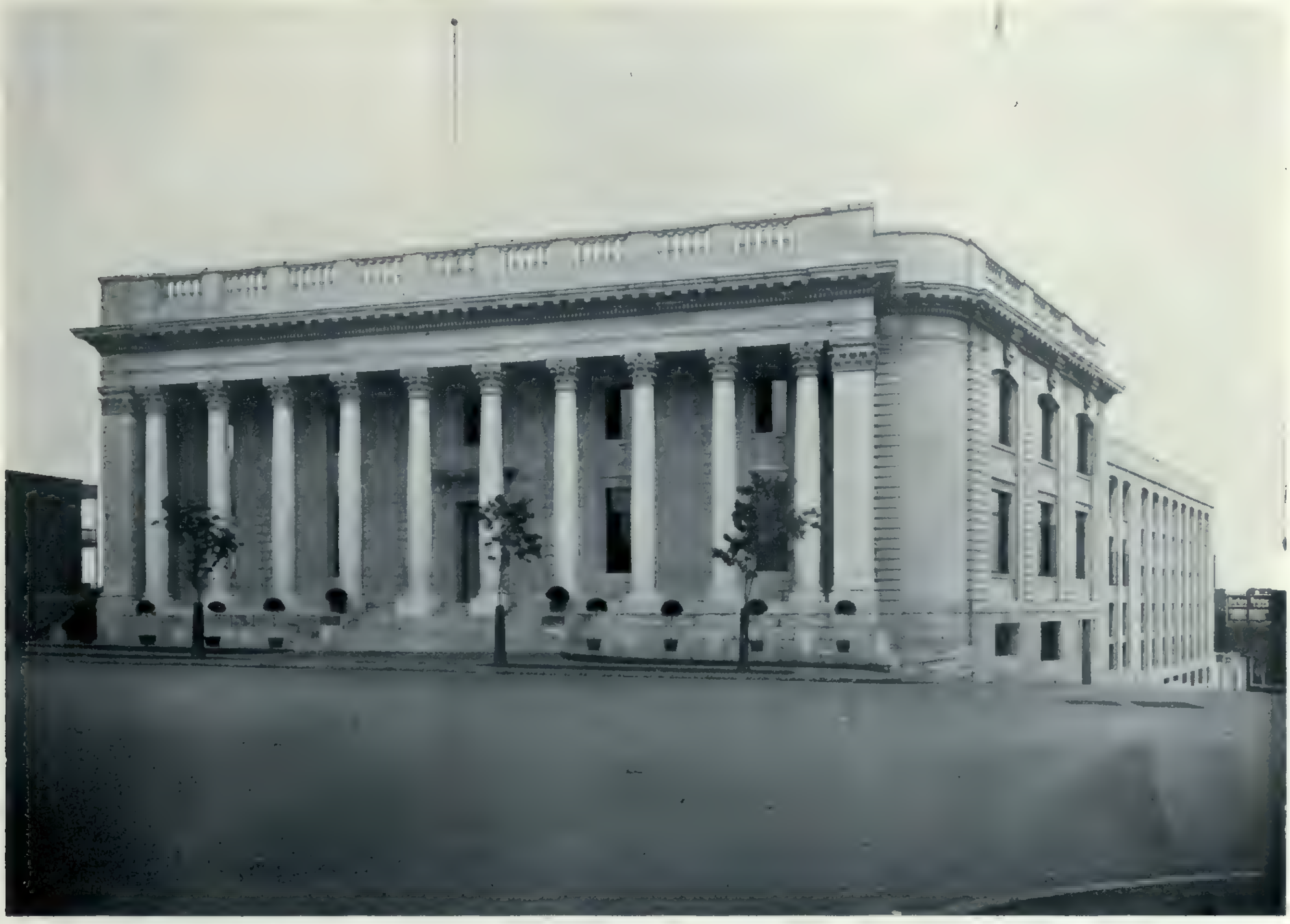


DISTRIBUTING ROOM. MONTREAL PUBLIC LIBRARY. EUGENE PAYETTE, ARCHITECT.



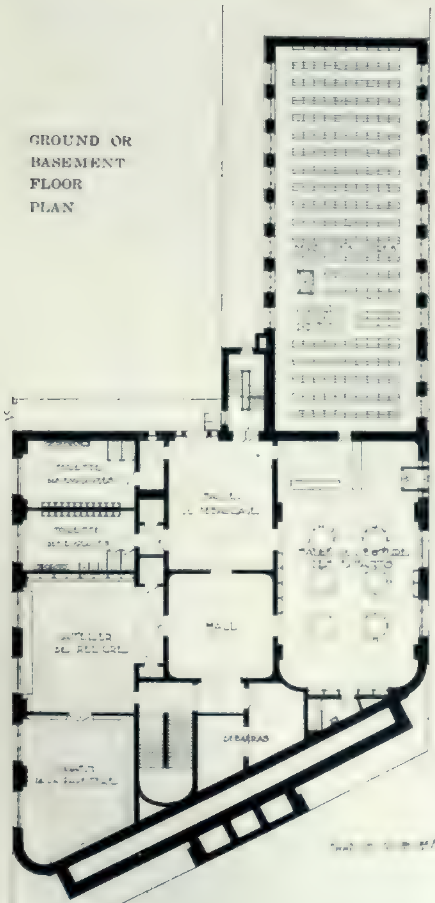
MAIN FACADE, SHERBROOKE STREET EAST, MONTREAL PUBLIC LIBRARY.

EUGENE PAYETTE, ARCHITECT.

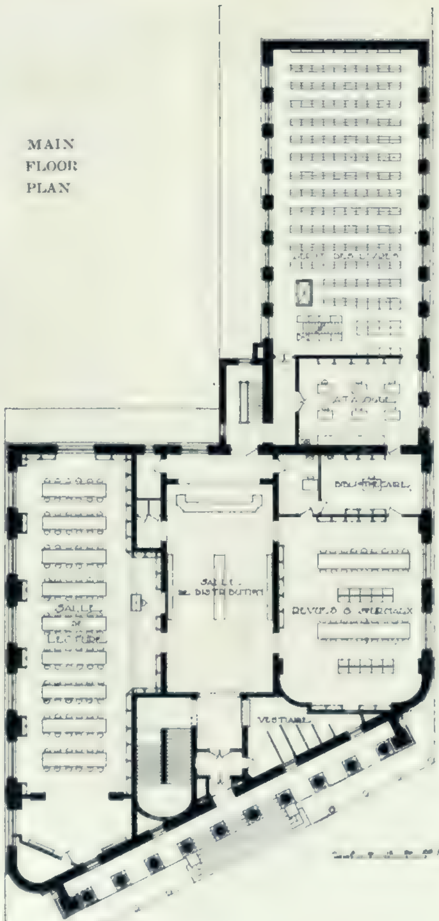


GENERAL VIEW, MONTREAL PUBLIC LIBRARY. EUGENE PAYETTE, ARCHITECT.

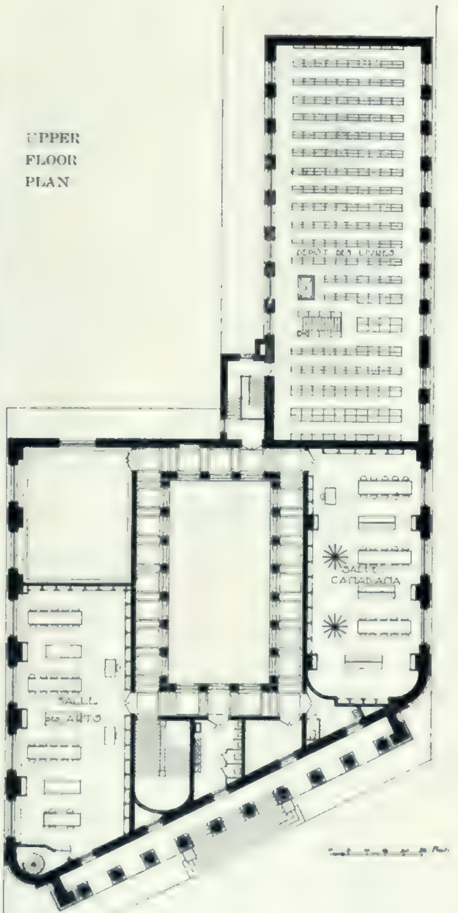
GROUND OR
BASEMENT
FLOOR
PLAN

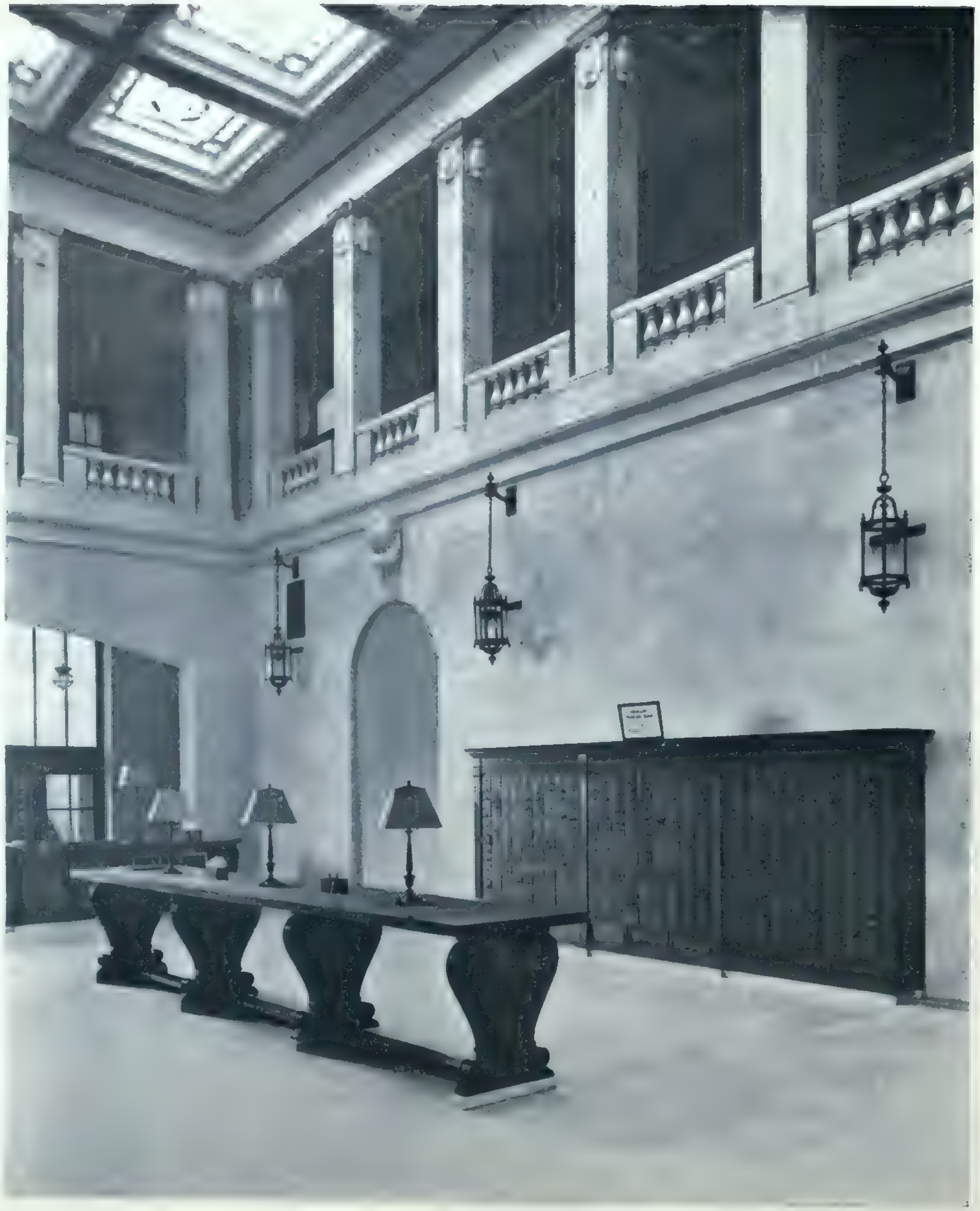


MAIN
FLOOR
PLAN

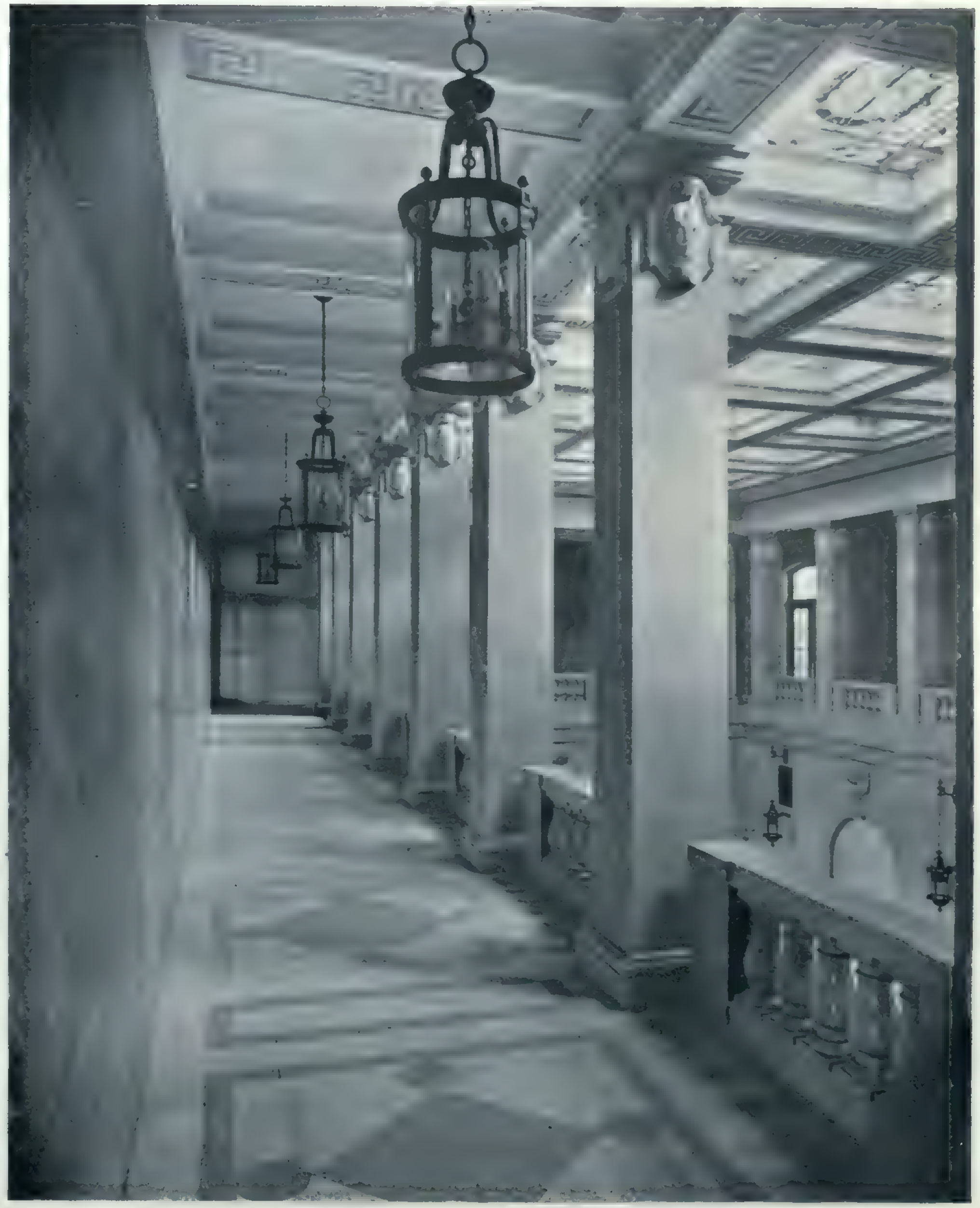


UPPER
FLOOR
PLAN





MAIN DISTRIBUTING HALL, LOOKING TOWARDS ONE OF THE DOORWAYS LEADING TO PERIODICAL ROOM, MONTREAL PUBLIC LIBRARY.



EAST GALLERY OF DISTRIBUTING HALL, MONTREAL PUBLIC LIBRARY.
EUGENE PAYETTE, ARCHITECT.

having cream colored pressed brick walls with floors of red quarry Welsh tile.

In the main vestibule, which is entered from Sherbrooke Street, is a bronze tablet inscribed with the names of the Mayor, Commissioners, and Aldermen of the City, together with those of the architect and general contractor of the building. This tablet is crowned by a carved marble pediment carrying the coat-of-arms of the city, with the coat-of-arms of the province on the opposite side.

The principal feature of this floor is the distributing room, the furniture of which consists only of a centre table, two card catalogues and a counter.

MAIN READING ROOM, MONTREAL PUBLIC LIBRARY.

The walls and colonnade are built of light Missisquoi marble. In the frieze over the colonnade are the names of famous authors incised in gold letters and placed in chronological order. This interior is lighted from the ceiling by twenty-one panels of leaded art glass, divided into three rows of seven panels each, and having as their main feature a shield bearing various coats-of-arms. These represent (1) the crests of the old provinces of France which furnished most of the settlers at the time Canada was a French Colony; (2) memorials to Cartier, Champlain and other early Canadians; and (3) representations of the seven oldest provinces of the Dominion. The leaded glass is protected by three thicknesses of plate and wired glass.

The card catalogue cases contain 810 drawers accommodating 700 cards each. In these cases an innovation, first introduced by the architect in the Bibliotheque Saint Sulpice, consists of a rod which is invisible on the face of the case and locked at the back, thereby preventing the public from tampering with this rod and minimizing the risk of getting the cards mixed.

The distributing counter contains the charging desk for outside circulation. This comprises seven trays, forty drawers for subscribers' cards, cash drawer, and four compartment drawers for book slips and shelves for the temporary storing of returned books.

In the periodical room the furniture consists of two large tables with bookrests for magazines, inclined shelf book-cases, newspaper table and two racks with accommodations for newspapers. The reading tables and chairs are numbered, enabling a visitor to leave an inquiry for a book at the counter to be delivered to him at one of the numbered seats at the reading table.

THE CANADIAN ROOM, MONTREAL PUBLIC LIBRARY.

CORRIDOR IN STACK ROOM, MONTREAL PUBLIC LIBRARY.

The "Canadian" room, which is situated on the upper floor, contains, in addition to the tables, cabinets, etc., several multiplex display cases with folding panels, glassed, and resting on a pivoted frame, these being available to display rare manuscripts, autographs, engravings and photographs. The art room contains tables under which are roller shelves for large books.

All available wall space in every reading room is occupied by built-in book cases; those of the main reading room being open, while sliding doors having a locking arrangement are used where valuable books are kept on the upper floor. Every unit of furniture, such as counters, tables and book cases, is provided with a marble base.

The reading rooms and other departments devoted to staff work are equipped with electric bronze clocks controlled by a master clock located in the bindery. There is also a watchman time recording system with two registering stations placed at the extremity of each other on each floor. The stack room has accommodation for 5,000 bound newspaper volumes and 300,000 other volumes of miscellaneous sizes. Besides this there is accommodation for a large number of books in the various reading rooms.

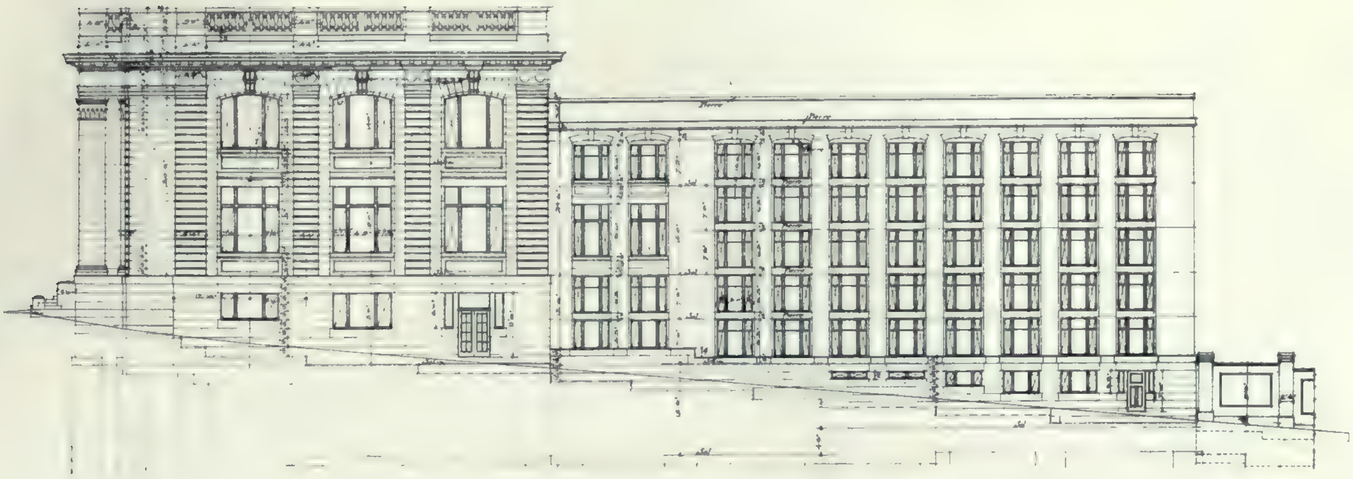
The only difficulty met with in carrying out the work was due to the presence of clay, quicksand and water on the site, which complicated putting in the foundation, and in order to gain time pending the completion of the plans and specifications, this part of the work was started Oct. 24th, 1914, on a percentage basis, the city supplying the material and labor.

The general contract for the superstructure was awarded April 29th, 1915, at the time the foundation work was completed, and possession of the structure was taken over by the city on May 1st, 1917, just about two years to the day from the time the contract for the superstructure was let.

Totally considered, it is a building which not only results in a notable addition to the public architecture of Montreal, but in its erection the city realizes a long-felt civic need, besides obtaining accommodations which will adequately meet the present and to an extent the future requirements of a growing population.

Marble is used extensively throughout the interior, both for floors and

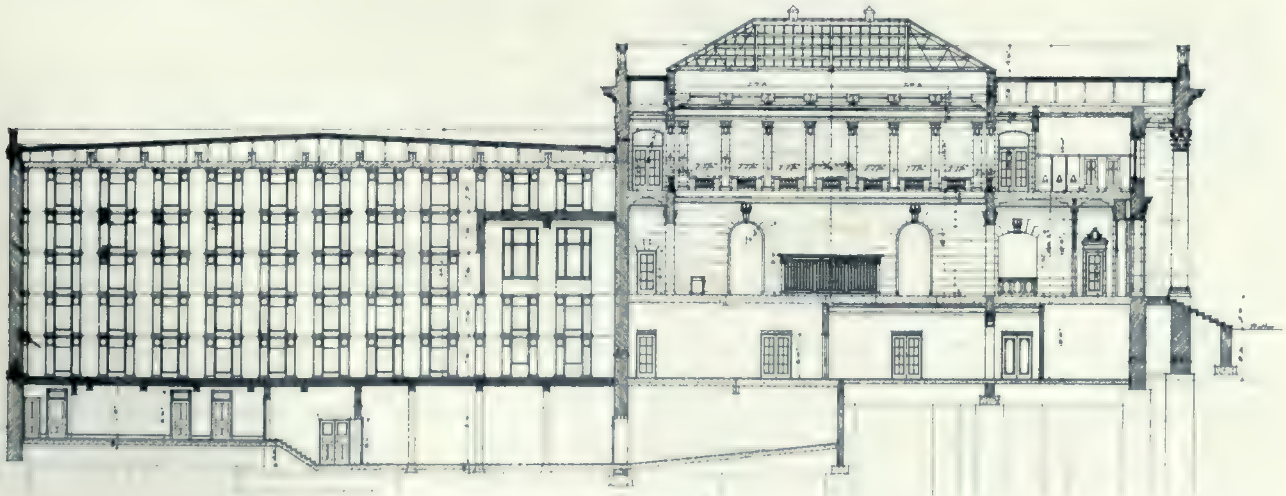
PERIODICAL AND NEWSPAPER ROOM, MONTREAL PUBLIC LIBRARY.



MONTCALM STREET ELEVATION, MONTREAL PUBLIC LIBRARY.

walls, with the exception of the reading room, where the floors are of tile with marble border. The exterior walls of the building are of grey Queenston limestone on a light granite base, Stanstead granite being used for the ten columns forming the colonnade, the dimensions of which are three feet in diameter at base and twenty-five feet high. The building contains 1,200,000 cubic feet, and cost $560,500 (46.6c. per cubic foot), including furniture and electric light fixtures, but exclusive of the cost of the land.

CHILDREN'S READING ROOM, MONTREAL PUBLIC LIBRARY.



LONGITUDINAL SECTION, MONTREAL PUBLIC LIBRARY.

Why The Practice of Technical Professions in Canada Should be Regulated by Law

By J. P. HYNES

Paper read before Royal Architectural Institute of Canada.

THE questions of architectural education and of legal restrictions on the right to practice architecture have agitated the architects of the English speaking world for more than a generation. To-day the question of a college educational course is practically conceded on all sides, while the question of legal restrictions is slowly taking form in actual legislation in at least ten States in the American Union and was before the Imperial Parliament when war broke out. In Ontario ten years ago these questions were discussed with considerable feeling and for the time settled in favor of promoting education and dropping legislation; the expectations being that the educational institutions would then fulfill the reason of their existence and supply the province with trained men to handle its problems. However, the constant and growing usage of alien architects erecting most of the larger commercial buildings of the province has raised the whole question again, and the following is an attempt to state the present situation and point to its remedy.

On investigation it was found that alien architects have for at least the last thirty-five years almost continuously practiced in Ontario on a large number of important buildings, as may be instanced by the following examples:

Starting with the Western Assurance Company building, in Toronto, there has followed in almost continuous succession, the Canada Life Assurance Building, Toronto; the Canadian Bank of Commerce, Toronto; the Bank of Hamilton, Hamilton; the Ontario Parliament Buildings, Toronto; the Toronto Board of Trade, the Bank of Hamilton Building, Toronto; the Bank of Toronto Building, Toronto and St. Catharines; the Imperial Oil Company's Building, Toronto; two buildings for the Robt. Simpson Company and three for the T. Eaton Company, in Toronto, and one in Hamilton. At the present time there is under construction or about to be erected in Toronto, the T. Eaton Company warehouse; the T. Eaton Company departmental stores; the Wm. Davies Company abattoir, and buildings for the Brown Brass Company; the Goodyear Tire Company, the proposed Devonshire Hotel, and several theatres, while throughout the province there are the International Nickel Company's buildings, Port Colborne; the Dominion Government Arsenal, Lindsay; Dominion Government Explosive factory, Renfrew; Dominion Government Explosive factory, Trenton.

The effect on the resident architects is that it is depriving them of the opportunities that the province naturally affords them, and which, if they enjoyed, would bring them such recognition that there would be little thought of bringing aliens into the province.

The effect on the practice of architecture in the province is to discourage the resident practitioners and drive the young men graduates from the University from the province, and create a strong tendency to a low standard of practice by introducing unfair competition; as very frequently the alien practitioners practice on a purely commercial basis even to the extent of association with the contractor in such a way as to make it appear to the client that the architect's services are of such little consequence that they are thrown in by the contractor.

Through the personal agitation of a number of architects and builders, considerable comment on the number of alien architects practicing in the province, appeared in the papers, noticeably the trade journals, and was eventually discussed at an executive meeting of the Toronto Branch of the Canadian Manufacturers Association. This led to an interview between the President of the above Association and the President of the Ontario Association of Architects, after which the former, on behalf of his association, convened a meeting of representatives from the Toronto Branch of the Canadian Manufacturers Association, the Ontario Association of Architects, the Toronto Branch of the Canadian Society of Civil Engineers and the Toronto Builders Exchange.

After considerable discussion it was determined to jointly memorialize the Dominion Government, to bring to its attention the extent to which alien architects and contractors were doing business in Canada and that even the Government itself had given the erection of the new arsenal, at Lindsay, to aliens.

In drafting this memorial, many suggestions were deliberated upon; some were realized to be impracticable and others were deemed inefficient, as may be illustrated by the two following cases:

It was considered that if there was the same legislation to prohibit American architects practicing in Canada as there was thought to be prohibiting Canadians practicing in the United States, it would be a satisfactory method of control. Upon direct correspondence with Washington it was learned, however, that the legislation restricting aliens entering the United States excepted members of the learned professions and that the Department of Immigration at Washington had ruled that any architect, while residing in his own country and holding a certificate of graduation from a recognized university or of good standing in a recognized society of professional architects, might practice in the United States subject to State license and registration laws. It may be observed in passing, however, that this permission extends only to the individual who is a member in good standing, and not to his staff of employees.

The other was to control the practice by Customs duties and this was discussed with the Customs expert of the Canadian Manufacturers Association. The present duty is 22½ per cent., plus a war tax of 6½ per cent. on 4 per cent. of the cost of the building, which is evidently too low to act as a deterrent on the employment of alien architects and is easily avoided and frequently entirely evaded. A duty high enough to be a deterrent was deemed impractical to obtain or administer, as well as being too easily subject to change, the duty on architectural drawings having been subject to several variations in the past few years.

Legislation controlling the practice of architecture has been in force in Quebec for twenty-six years, and more recently in Manitoba and Saskatchewan, and in ten of the United States, starting with Illinois in 1897; New Jersey, California, New York, Utah, Florida, Colorado, Michigan, Louisiana, and North Carolina have since then adopted some form of license of registration for architects.

It is understood that many architects in the States, where license laws are in force, are disappointed at their lack of effectiveness in improving the status of the practice of architecture; and that the advancement in that direction was more attributable to the increasing number of architects who took University courses of training. It is also evident that the Quebec, Manitoba or Saskatchewan Acts have not been effective in protecting resident architects in their respective provinces from undue alien competition.

The model for such legislation before the Ontario Legislature would undoubtedly be the Ontario Medical Council Act, which licenses medical doctors to practice in Ontario, but the experience of the Ontario Association of Architects ten years ago and graduate nurses and others who have since sought similar legislation, indicates that the objection that such legislation is close corporation legislation would defeat any effort on these lines, as there is not sufficient parallel between the practice of medicine and architecture to ask that legislation similar to that given to the doctors be given to the architects.

It is primarily for the protection of the public that the doctors are licensed, and there appears to be no better way, as doctors must act instanter. The public, however, are most effectively protected in their relations with architects by laws on sanitation and construction, and it is no hardship to the architects to practice under these laws.

Out of this question of licensing arises the question of a standard of qualification which should govern the practice of architecture, or in other words, what standard of education should be required. The standard of education to-day is not that of a certificate from an examining or licensing board, but that of a course in architecture in a recognized university, and from this arises the question "Whose duty is it to provide the University course?"

This was found in the principle put forward at the time that the Ontario Association of Architects withdrew its bill for licensing in deference to the contention of the University of Toronto that to license by examination without a course of tuition would set up a low standard of education for architects in Ontario and at the same time be detrimental to the advancement of the university courses in architecture.

"The principle was that as the Province needs men of training to handle the problems of the community, it devolves upon the province to provide the means by which such training may be obtained."

That the Province admits its responsibility in this is evidenced in fact by its whole educational system, but especially by its higher educational and university courses.

In looking into the status of the various professions trained in these courses in this province, namely, medicine, law, dentistry, pharmacy, pedagogy, veterinary surgery, engineering in its many branches, architecture, chemistry, and in the many other branches of technology, it was observed that medicine, law, dentistry, pharmacy and pedagogy enjoyed the confidence of the people of the Province, even to the extent of a pronounced pride being evinced by the public that not only was the rank and file of these callings of a high standard, but that many in them attained to eminence in their professions. Moreover, it was observed that the people of the province did not resort to non-resident and alien practitioners in these callings.

The legislative restrictions accounted directly for the latter and indirectly for the confidence and pride the public evince.

It is evident that in a province like Ontario there is sufficient practice in every one of the professions named for men of ability to attain distinction, and that in those professions that had the opportunities of the province conserved for them many men of distinction were constantly in evidence, but that in such professions as did not have the opportunities conserved for them the men of distinction were not so numerous and alien practitioners were always evident.

Examining the situation under this light, it became evident that architects are one of the less favored group and that their grievances are shared by all practitioners of technology.

The conclusion evidenced by the above is that the Government, to attain the object of its higher education in technology, namely, to provide the province with men of training to serve the community and in whom the community may have confidence and pride, must conserve the opportunities of technical practice that develop in the province for the resident practitioners of such technical work.

It develops into a choice of raising the practitioners of technology in the province to the high standard that the educational facilities now provided by the Province for them, would under favorable conditions permit them to attain and which have been attained in the professions that have their opportunities conserved for them, or, of having these educational advantages in technology and the opportunities for technical practice of this Province exploited by students taking the course provided in this Province and immediately departing to devote their energies to other communities and by alien, non-resident and untrained technical practitioners exploiting the technical opportunities of this Province.

To allow the present conditions to persist is a flagrant breach of the economic principle that a country should develop its manhood and material resources for its own benefit rather than for the benefit of aliens.

In a word it may be stated that it devolves upon the Province not only to provide the means to train men to serve the community's need in technical work, but to make that training effective, it also devolves upon the Province to conserve the opportunities in the practice of technology in the Province for the resident practitioners.

This may be done by the Government establishing in the Department of Education a registrar who shall register all present resident practitioners of technology in the Province, and after the date of the first registration, all graduates in technology from the universities of the Province and such others who, on becoming residents of the Province, comply with the provisions set out in an act which would control in this Province the practice of technology in all its branches.

The advantage of legislation on these lines is that it keeps the control entirely in the hands of the Educational Department of the Province and at the same time makes the educational facilities of the Province efficient in results as they now are in training.

It eliminates all professional boards of examination or license, and maintains but one standard of education on which to practice, namely, a recognized university course.

DISCUSSION

Mr. Wickson stated that Mr. Hynes' idea seemed to be that if we had a school of architecture in our universities and if the Government were to legislate that the only people who could practice in Ontario would be those passed by the Department of Education and not by a board of architects or some outside body, it would largely tend to obtaining the ends desired. A number of Toronto architects including his own firm had a very rigid rule that they would not take a student into their office unless he passed through a university course.

Mr. Ouellette declared that this was similar to the attitude of the architects in Quebec, where students taking the course of architecture at McGill and Laval were given the advantage of spending their holidays in the office of a registered architect. Under this arrangement they obtained three or four months' practical experience in a year which enabled them to practically make the five years' course in four years.

Mr. Wickson briefly reviewed what had previously been attempted as regards legislation. He agreed that examination for admission to the practice of architecture should be in the hands of the educational section of the Province and not in the hands of the Association, and that the act should be formulated and enforced entirely by the Government. Mr. Hynes, Mr. Wickson said, was fully converted to the view that there is no encouragement for a young fellow trained in architecture to stay in Canada because aliens get the greater part of the work without any restriction.

Mr. Smith stated that the Government should make it impossible for aliens to come into the country. Canada did not want to lose her young men of ability and genius and there should be some encouragement to prevent them from going to the United States.

Mr. Pearson was of the opinion that this could not be prevented. About the only step that could be taken along these lines would be to penalize an architect who, living in the United States, entered Canada to practice.

Mr. Jordan could not see how Mr. Hynes' suggestion would change the situation. Perhaps it would have a tendency to greatly improve the standard of the architects who are permitted to practice in Canada; but how could that standard be controlled, or how could alien architects be prevented from coming in?

Mr. McLaren replied that if none but men who took a university course were permitted to practice it would virtually shut out the aliens.

Mr. Wickson agreed that it would raise the standard of the men and probably in the course of time only local work would get the work in this field. It was necessary to remember that architects from New York were taken to Chicago to do work, and architects from Chicago to Detroit, and so on. It would seem impossible to enforce the principle that the architecture of a place be done by its own men. If the Government would take a much more vigorous action in regard to education and if it would not give any work to firms outside of Canada the position might be different.

Mr. Smith referred to the practice of certain clients in going across the border for architects who perhaps have specialized in certain classes of buildings. Of course this was a thing which could only be overcome by education.

Mr. Wickson pointed out that the United States did not develop its high standard by the employment of outsiders. If one would go back into the history of the United States he would find that there were very few outsiders brought in.

Mr. Smith desired to know if it were only alien architects whom Mr. Hynes was aiming at, or the unsuccessfully trained architects as well.

According to Mr. Wickson it was both. The idea was that if all architects practicing in Ontario had to be properly trained men, it would raise the standard of the profession so that the importation of alien architects would cease automatically; and with this in view it would be a good thing to get the Government to become a little more active.

In answer to an inquiry Mr. Ouellette explained that the Quebec Act did not prevent aliens from coming into that Province. It only required that an architect must belong to some recognized association of architects in the country from which he came and if this was established and he registered in the Province he had the right to practice.

The remarks which followed were mainly devoted to the discussion of the Customs tariff. The present duty of 22 per cent. of 1 per cent. was considered entirely too low. Mr. Pearson thought that it should be 25 per cent. of the commission the architect receives.

He was of the opinion that if a man came from the States and opened an office there should be some deduction. His overhead, drafting charges and office expenses should be taken into consideration. However, if a man came into Canada, and simply opened an office without doing any of his work here, he should pay at least 25 per cent. of 5 per cent., but if he made all his drawings here there should be some allowance.

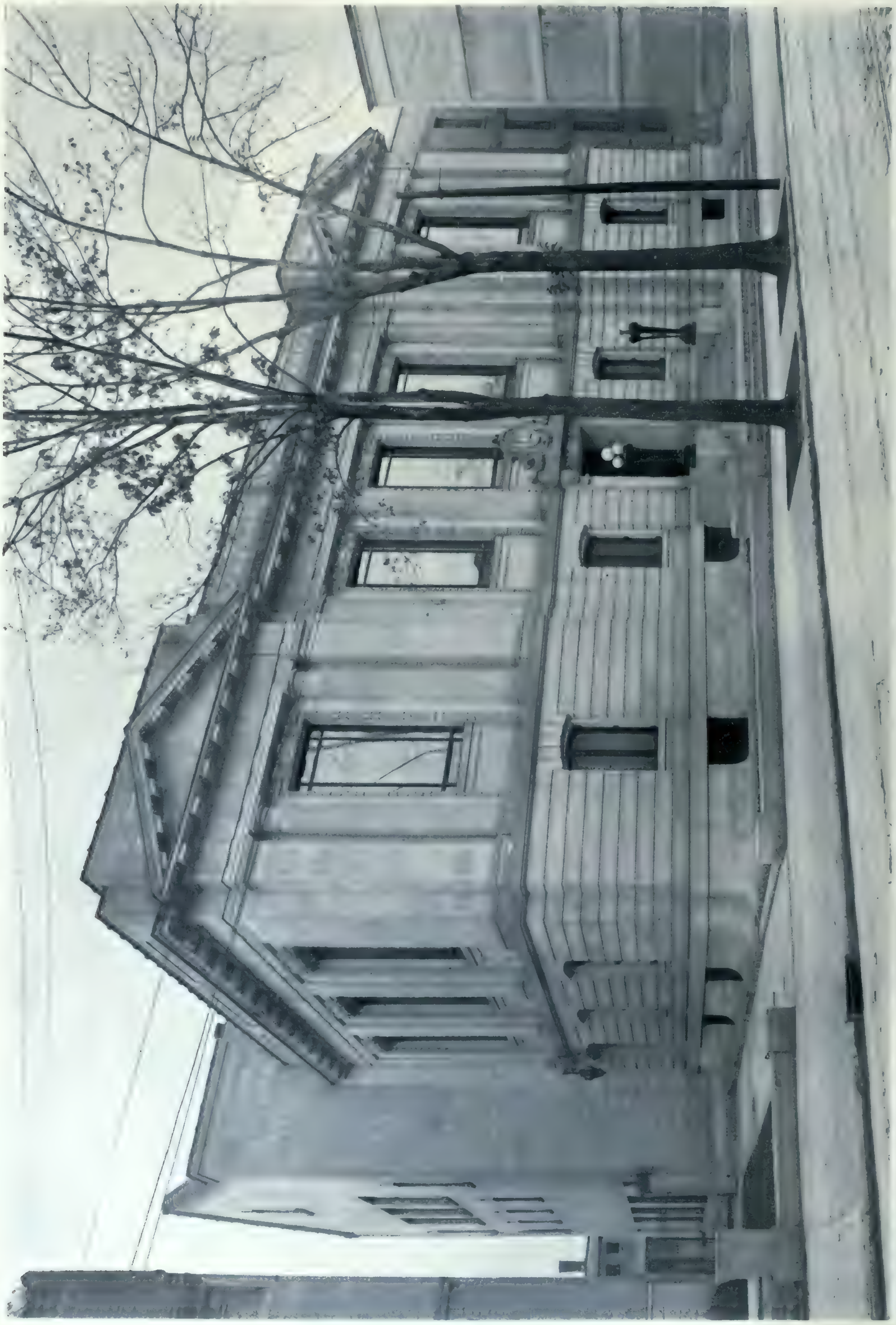
Mr. Wickson explained that the American law is different from the Canadian law in that it allows the Canadian architect to go to the United States and practice, but prevents him from taking any of his staff with him, nor could he send anyone as a substitute. If he has any work in the States he must do it himself. The alien labor law gives full protection to the United States, but does not operate effectively here in Canada. There were buildings put up in Toronto which the architects had never seen. The plans were made in the United States and sent up in charge of the head draughtsmen who simply opened an office here. On the other hand Jennings & Ross had some difficulty on the other side of the line. They got the work in the United States, but they could not take a single man in with them. They had to hire all their men there.

FAST CONSTRUCTION WORK

In an interesting article describing the construction of Camp Upton, one of the sixteen great cantonment cities for the National Army of the United States, the "Engineering News-Record" describes the method of building wooden barracks. The barracks are built flat, on the finished floor, and are raised to their vertical position. The standard unit is two storeys high, and measures one hundred and forty feet by forty-three over all. The construction of the sides, as noted above, eliminates the use of scaffolding. Wooden posts are sunk in holes several feet deep, to carry the sills and floor joists, and a rough flooring is then laid. Upon this flooring the two sides of the structure are framed, and upon the studding lying flat on the floor of the building, tar paper and wooden sheathing for the side is nailed. In other words, the sides of the building are put together complete in a horizontal position. When the wall is completed, snubbing lines are attached at intervals along the outer edge. As the wall lies flat on the flooring, workmen are lined along the inner edge every few feet, and, at a given signal, raise the wall up to a vertical position in a manner very similar to the old method of barn-raising so commonly practised in farm districts. When raised to its vertical position it is held by temporary bracing until the other side wall and the end walls can be raised into place in the same way. This scheme of construction is said to be a great time-saver, as it not only does away with the use of scaffolding but ensures more rapid work on the part of the carpenters, who are enabled to do all the framing and nailing of the siding at ground level.

◆

Auguste Rodin, the famous French sculptor, is dead. He was born in Paris in 1840, and his peculiar style did not gain recognition until 1880. His impressionistic and inspirational works are known throughout the world.



BIBLIOTHEQUE SAINT SULPICE, MONTREAL.

EUGENE PAYETTE, ARCHITECT.

Bibliotheque Saint Sulpice, Montreal

THE Seminaire de Saint Sulpice decided to build the library building bearing its name in 1911, when the "Cabinet de Lecture Paroissial," then situated on Notre Dame Street had outgrown its housing facilities.

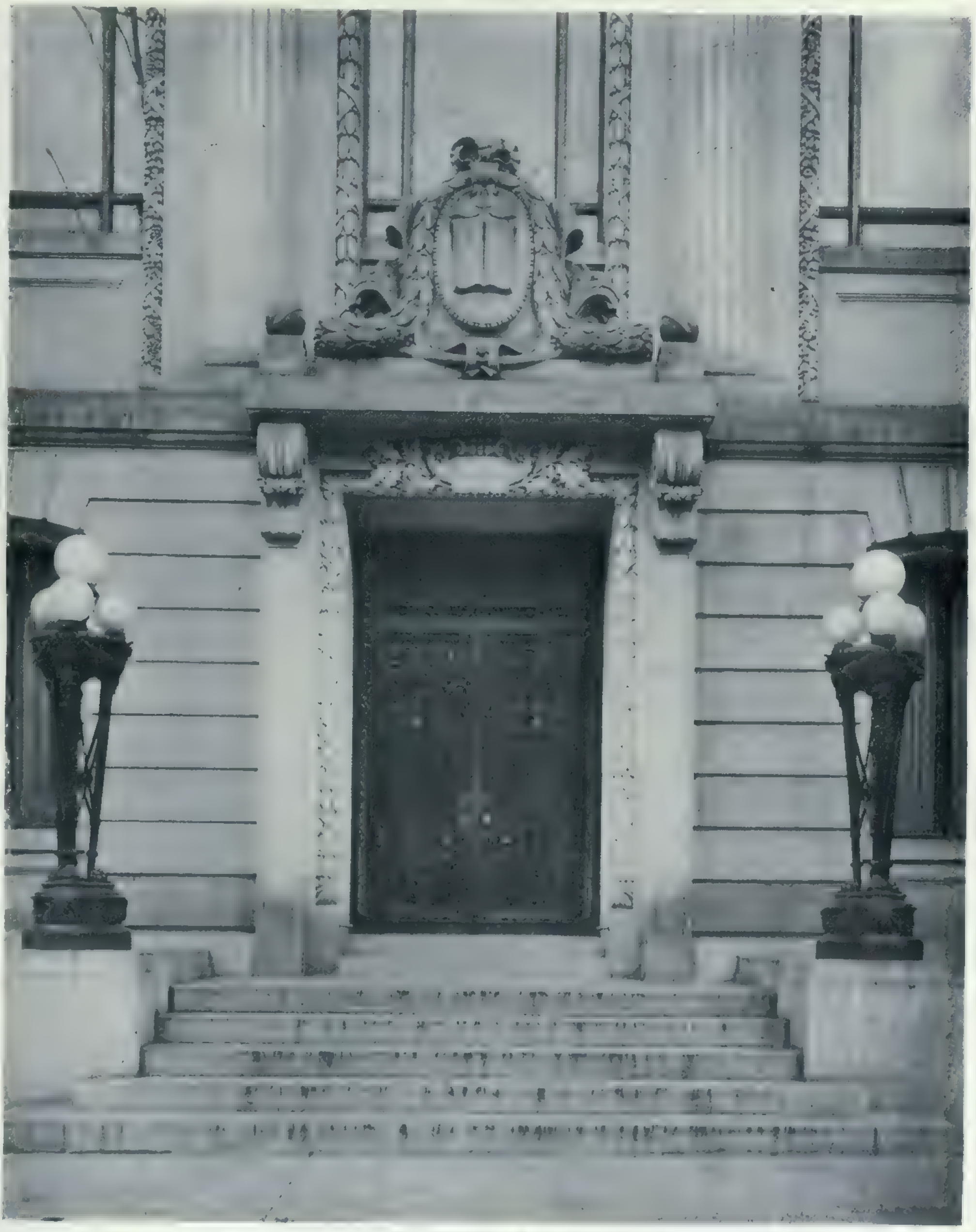
An architectural competition was accordingly held, restricted to Canadian architects; the programme providing for two distinct services each independent of the other, one devoted to a lecture hall and the other to the library proper. Although the institution is free to the public, as most establishments of this kind are, the fact that it is essentially a private enterprise made it necessary to plan the building so that the administration and supervision could be carried out in an economical manner and with as small a staff as possible. This consideration was thought to be of utmost importance by the owners. Other conditions provided that the structure should be fireproof and isolated as much as possible from its neighbors as well as from the janitor's apartment so as to reduce the risk of fire to a minimum.

The dimensions of the lot are 136 feet wide by 161 feet deep to a public lane. The extreme dimensions of the building are 108 feet wide, 144 feet deep, and 67 feet high from the foot path level.

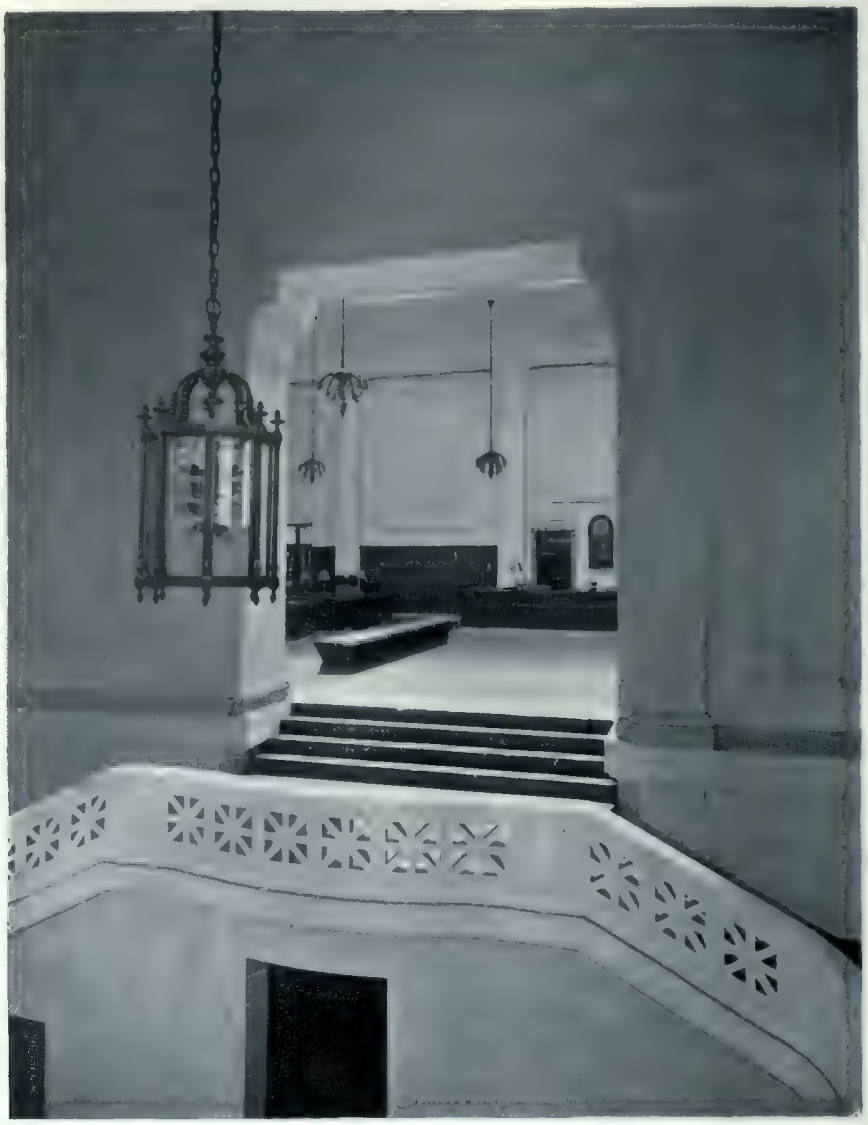
The services of the lecture hall on the basement floor level, access to which is gained by two side entrances, include a foyer 23 x 38 feet, a room devoted to small gatherings of the various literary societies, 21 x 28 feet; office of the director of lectures, of similar dimensions; coat room and toilet and two rooms for the accommodation of artists when the hall is used for concerts. The hall measures 56 x 103 feet exclusive of the stage, and contains nine hundred seats. This room occupies the full height of the basement and the ground floor, measuring 24 feet high.

Entrance to the library proper is direct from the street and entirely separate from the lecture hall just described, in order to insure the readers the necessary quietness. The entrance hall is 38 feet 6 inches wide, 36 feet deep, and 32 feet 6 inches high; while immediately adjoining is an exhibition room 21 x 28 feet, and a reception room of similar dimensions.

The main reading room which is reached by monumental stair-case, has the same horizontal dimensions as the lecture hall below and measures 30 feet in height. At each end of the room there are two tiers of studies. Six studies are in alcoves on the main floor and six are formed by the division of the book cases in the gallery, making twelve studies in all. These are all exposed to view and are therefore of easy



MAIN ENTRANCE, BIBLIOTHEQUE SAINT SULPICE, MONTREAL.



VIEW OF MAIN READING ROOM FROM GALLERY OVER VESTIBULE.

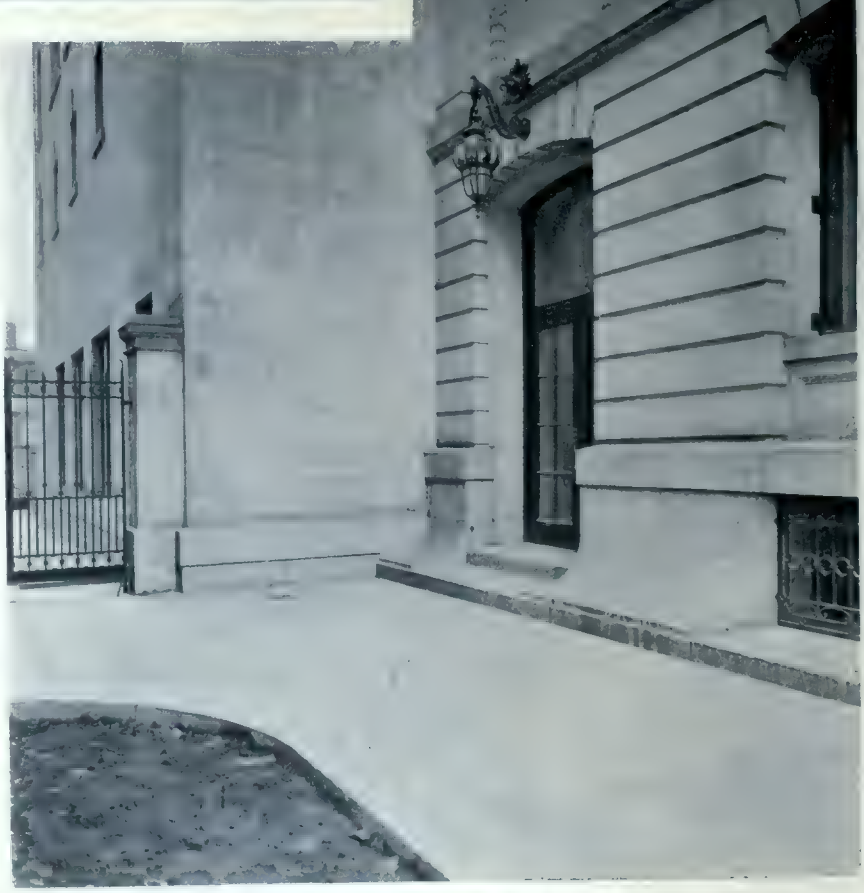
supervision. The counter in the axis of the room, which is reached through a generous aisle flanked on each side by settees, serves for both the circulating department and the distribution of books to be read on the premises. The card catalogue cases are against the rear wall between the librarian's offices and counter. The room designated as No. 5 on the plan is devoted to periodicals and room No. 6 is for references. These rooms are linked by a gallery situated over the vestibule and coat room, and both are 21 x 39 feet, and 20 feet 6 inches high.

At the rear is the stack room with a capacity of two hundred thousand volumes and contains four tiers each seven feet high the second of which corresponds to the level of the reading room floor. It will be noted that the librarian's office and cataloging room are both situated in the stack, there being one tier under and one tier above same.

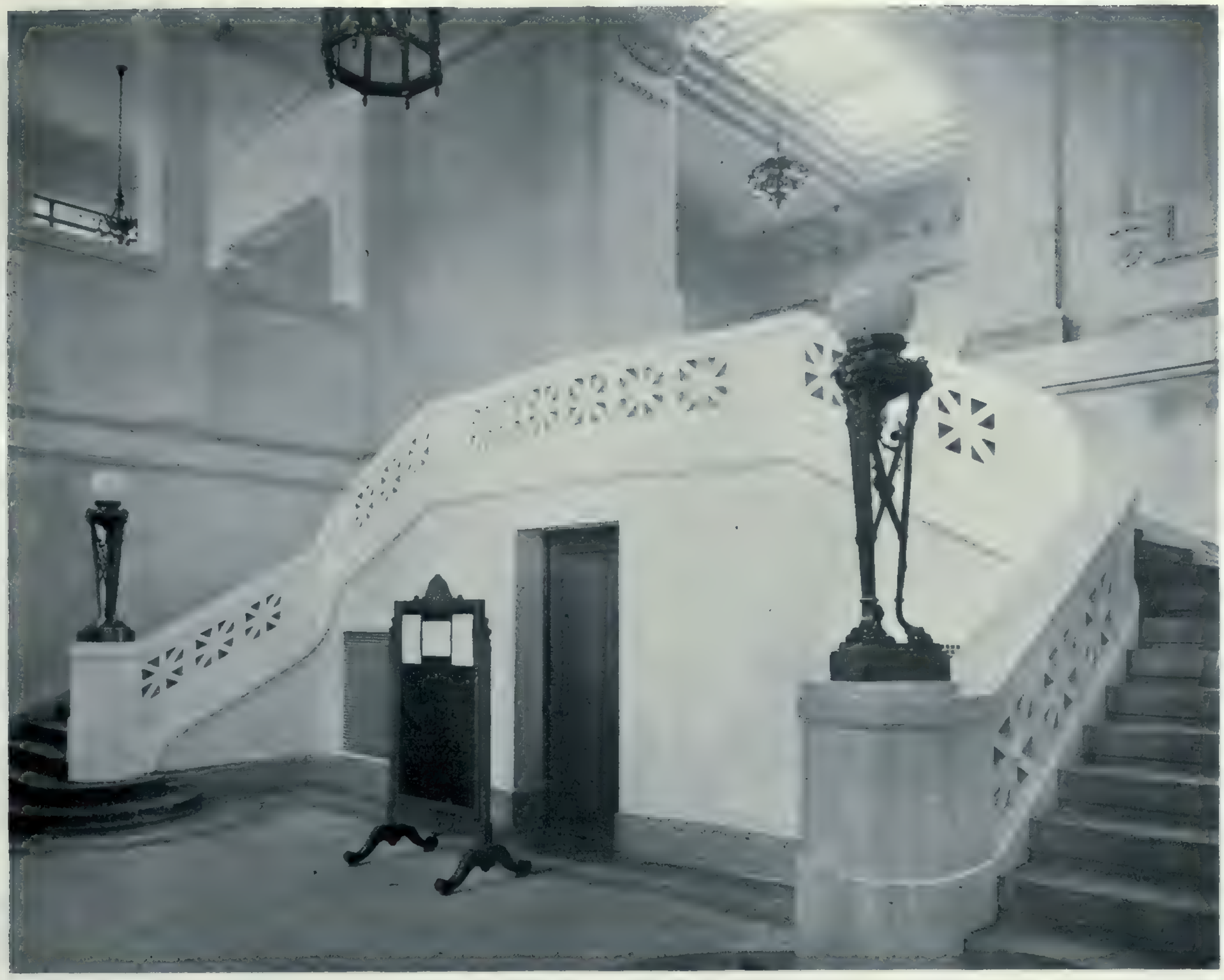
The exterior basement walls are of grey granite and the superstructure of Ohio sandstone.

For the interior a cream colored vitrified brick has been used in the stack room and other accessory services in the basement. The main entrance hall, lecture hall, and reading room have a Caen stone finish, and marble floors except for the field of the latter which is cork tile.

All rooms have art glass windows. The three principal ones, which are in the hall gallery, have allegorical representations of religion, art and science. In the side windows of the periodical room are depicted the coat-of-arms of Dieppe, Honfleur and St. Malo, whose connection with the old French "regime" is well known, and in the front window is the coat-of-arms of France.



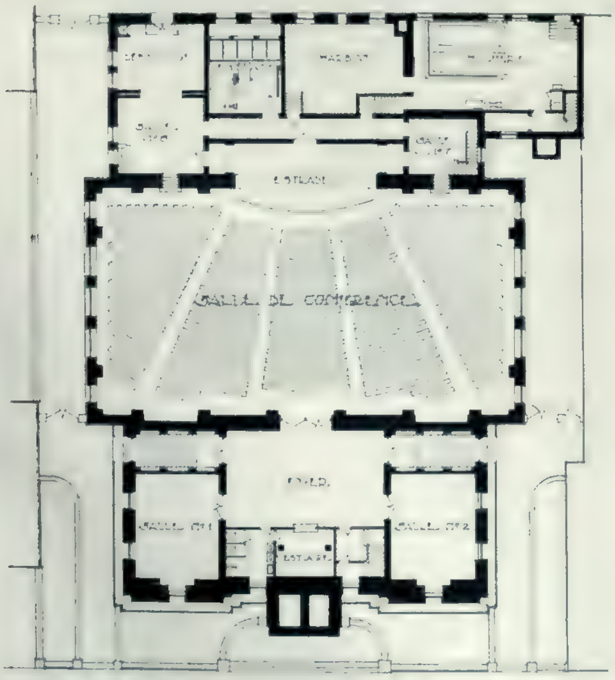
SOUTH ENTRANCE TO LECTURE HALL, BIBLIOTHEQUE SAINT SULPICE, MONTREAL.



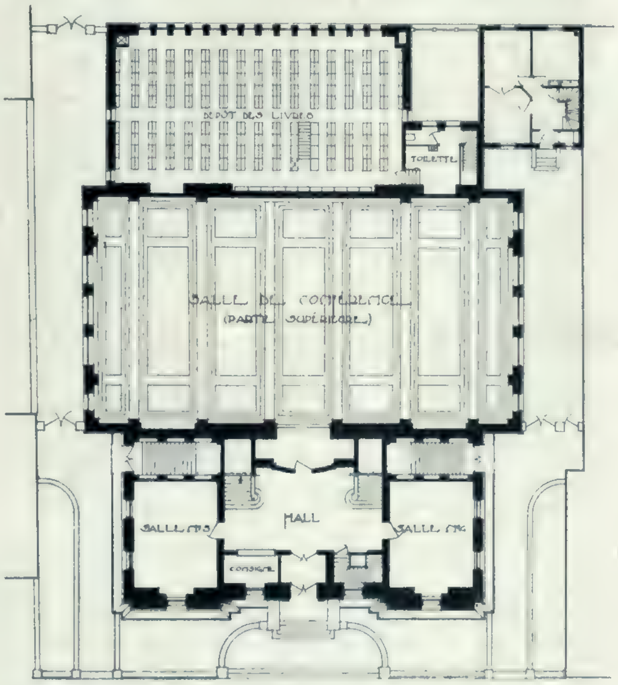
MAIN STAIRCASE TO READING ROOM, BIBLIOTHEQUE SAINT SULPICE, MONTREAL.

The front window of the reference room contains the coat-of-arms of the Province of Quebec, and the side windows those of Montreal, Quebec and Three Rivers, the three principal cities in the province.

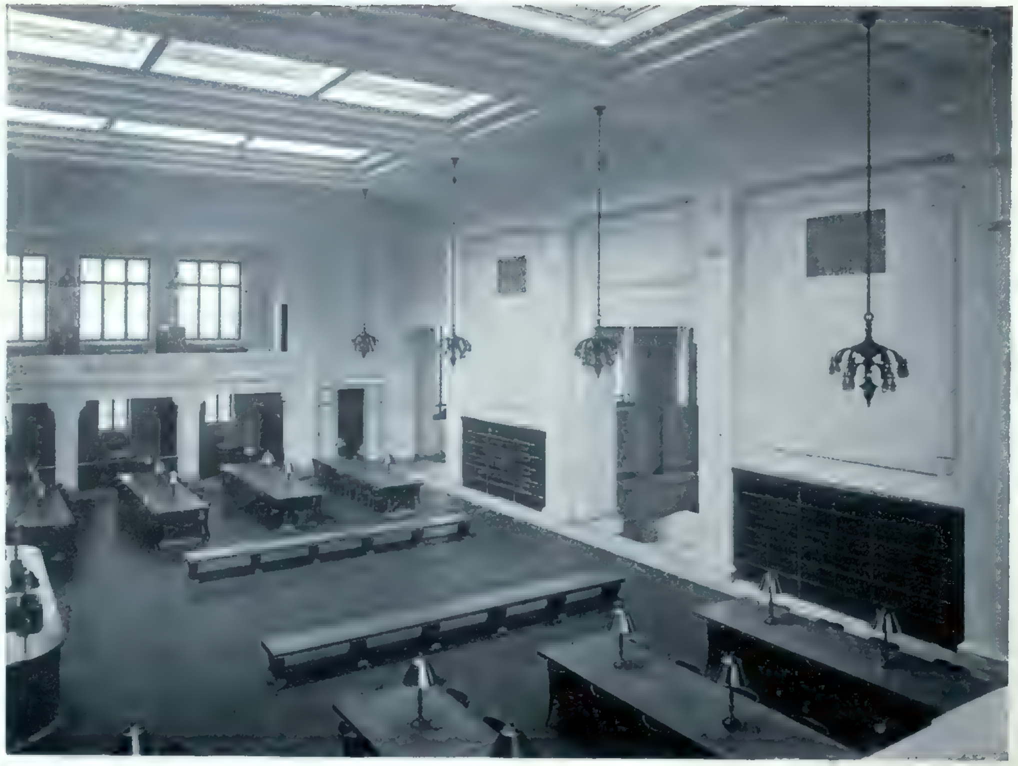
The cubical contents of the building is 900,952 cubic feet, and the cost per cubic foot 36 cents, bringing the total to $324,342.74, including furniture and electric light fixtures, but exclusive of the value of the site.



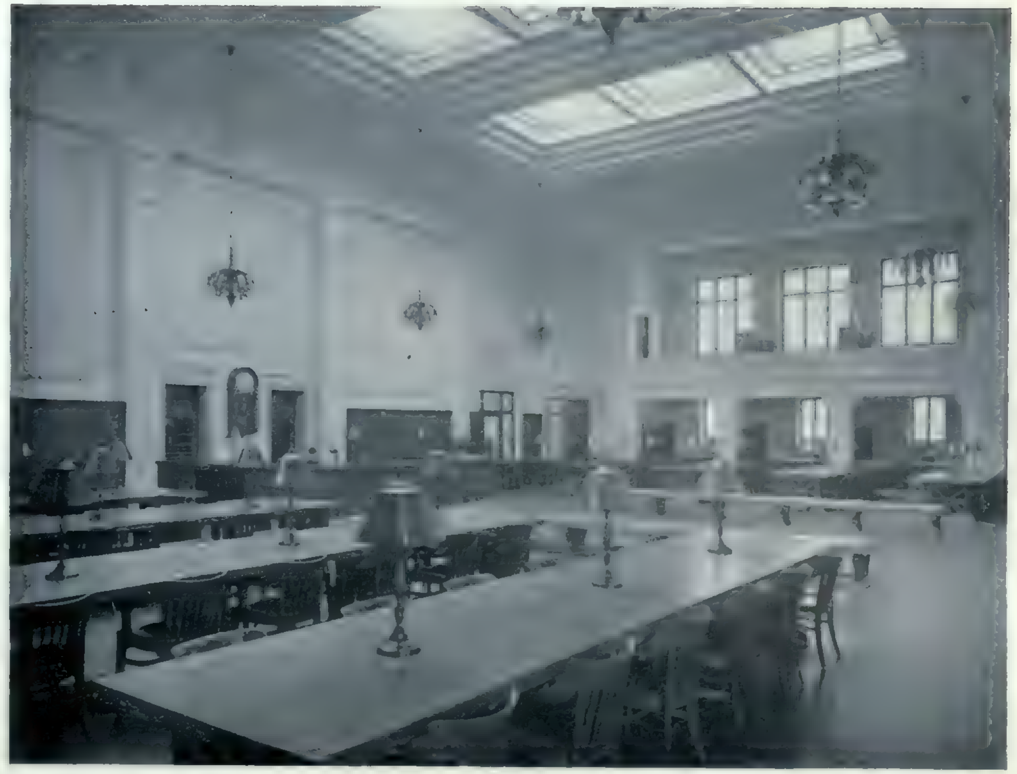
BASEMENT PLAN, BIBLIOTHEQUE SAINT SULPICE, MONTREAL.



GROUND FLOOR PLAN, BIBLIOTHEQUE SAINT SULPICE, MONTREAL.



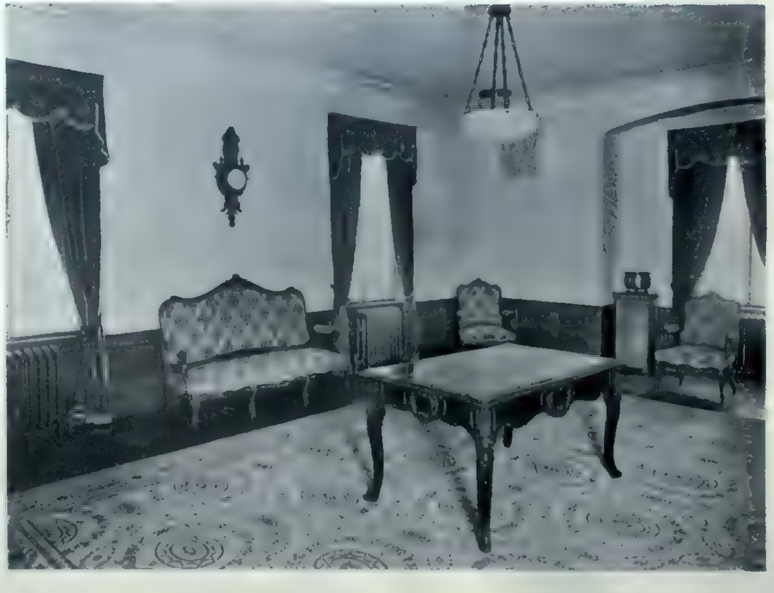
MAIN READING ROOM
LOOKING TOWARD
ENTRANCE.



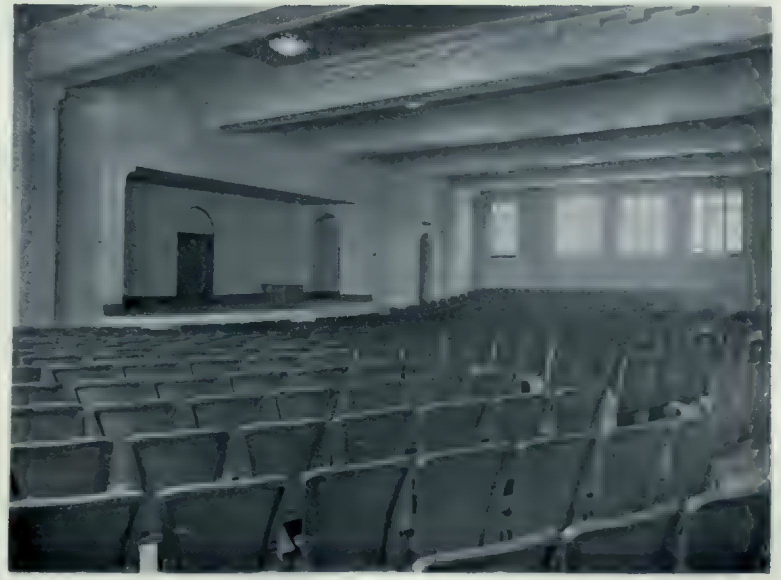
GENERAL VIEW OF
MAIN READING
ROOM.

BIBLIOTHEQUE-SAINT SULPICE.
MONTREAL.

EUGENE PAYETTE,
ARCHITECT.



RECEPTION ROOM.



LECTURE HALL.

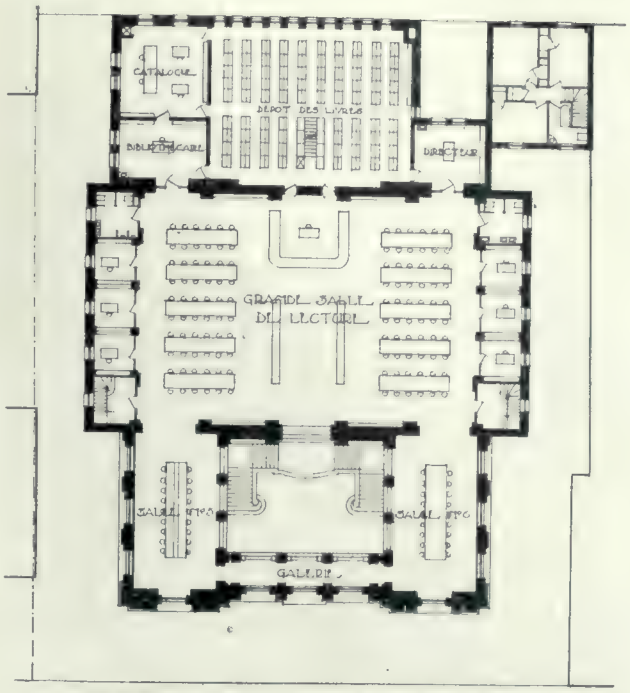
ARTISTIC STUCCO

By John B. Orr.

Stucco is among the oldest in some form or other of man's early attempt at the artistic. With all the possibilities, and despite the fact that there can be found to this day portions of stucco in a good state of preservation after standing the wear of many centuries, there is no other form of building material that has fallen more into disrepute than stucco. The causes can be largely traced to the slipshod methods of procedure that have gradually crept into our building industry. To-day the main point of view or achievement that is looked for is whether a contractor can complete in sixty days what should take three or four times longer. . . . Some contractors govern their cost by these methods and we get the results so often noticeable in modern construction, competition in price instead of competition in value or good work. The good contractor who tries to figure at a price that will permit good work, in many cases is forced out of business, leaving the field open to the cheaper man and cheaper methods. Encouragement and instruction should be given the craft to encourage good work.

HISTORY OF STUCCO.

Stucco was used in building almost as soon as buildings were found to be necessary. It grew from the crude mud huts to the artistic treatment of exteriors to be found in the old world to-day. Stucco is an Italian term usually applied in Italy to an exterior plastering, although we can trace it further back under a different name. The old Egyptians and the classical Greeks used a form of exterior plastering extensively. However, Italy is perhaps regarded as the mother of the plastic art, and responsible to a great extent for the artistic effects of exterior plastering generally known in this country as stucco. In Great Britain stucco is a somewhat indefinite term for various plastic mixtures. Robert Adam adopted stucco as a covering over houses built of brick and cobblestone, and it was used extensively during his period. . . . . The Temple of Apollo, at Delphos, and even the first Parthenon under the ægis of Pallas was plastered with stucco. Vitruvius calls the exterior plastering Tectorium Opus. This was composed of three coats of lime and sand and three coats of lime and marble, the united thickness not being more than one inch. The first coat was of common but very old lime and sand (lime that had been "soured" three or more years); when it was nearly dry a second and third coat was applied and left fairly straight. The work was then laid over with another two coats of lime and marble, and finished with a coat of fine marble powder; this finish of marble powder being trowelled into it before it was dry. The marble mortar was beaten to render it tough and plastic. The successive coats of marble mortar were trowelled into each other before they were dry. The tectorium was then painted in brilliant colors while it was still fresh. In certain conditions the surface was then rubbed with wax and pure oil for the purpose of adding to the brilliancy and endurance of the colors.

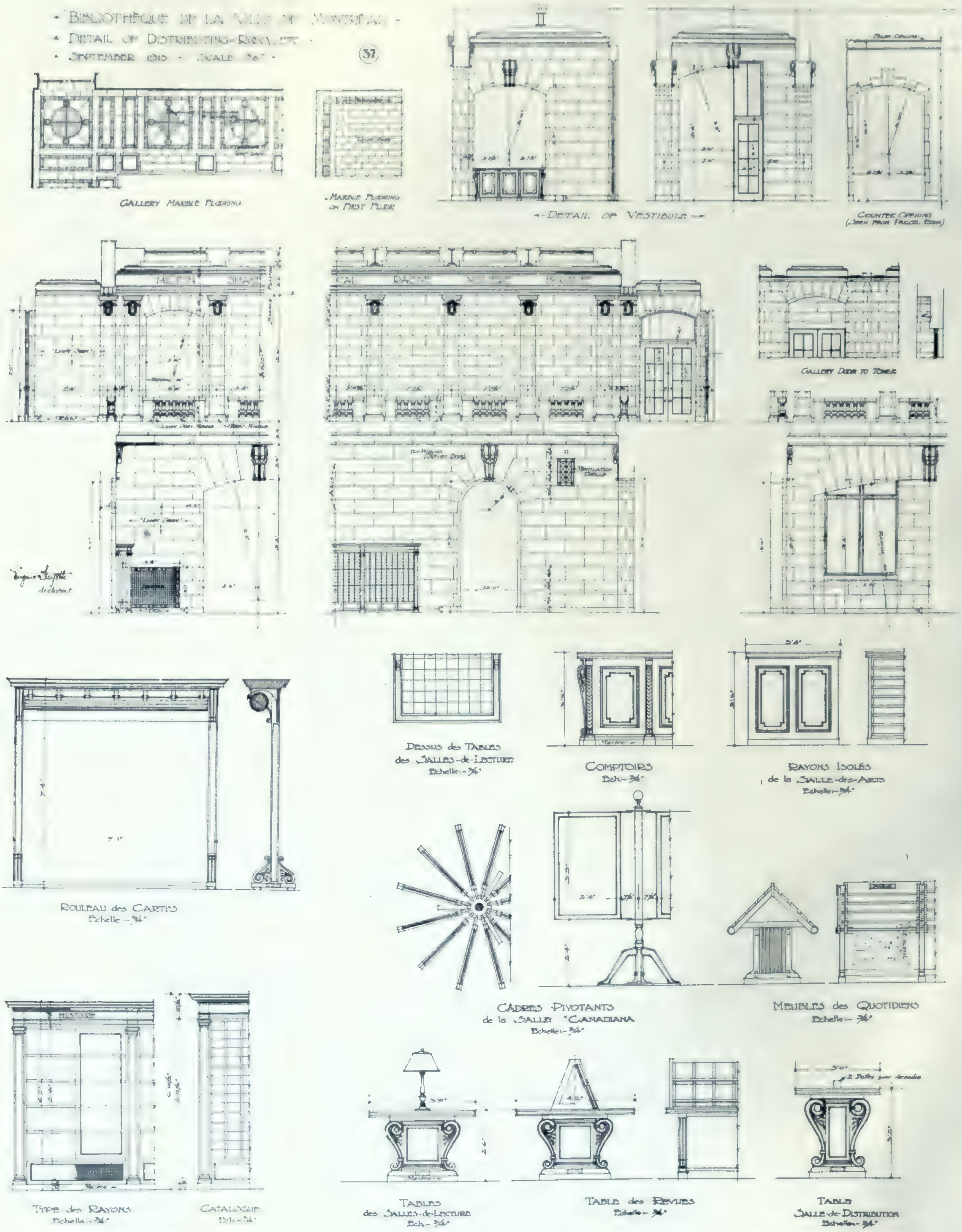


UPPER FLOOR PLAN, BIBLIOTHEQUE SAINT SULPICE, MONTREAL.

Slabs of this tectorium have been found and preserved from the ruins of Pompeii and Herculaneum and are in the Museum of Portici.

STACK ROOM, BIBLIOTHEQUE SAINT SULPICE, MONTREAL.

Specimens also from the same place are in the South Kensington Museum, London. It was found that some of this work was colored integrally, while in others it was colored by the use of a wash which was applied over the surface while it was still fresh. The early workers in stucco had each their different formulas for treating the stucco to make it weatherproof. Pliny mentions fig juice as being used in exterior plaster; elm bark and hot barley water were mixed with the stucco used on Justinian's Church of the Baptist, Constantinople.


BIBLIOTHÈQUE DE LA VILLE DE MONTRÉAL
DETAIL OF DISTRIBUTING-ROOM, ETC
SEPTEMBER 1915 - SCALE
(37)
GALLERY MARBLE FLOORING
MARBLE FLOORING ON FIRST FLOOR
DETAIL OF VESTIBULE
COUNTER OPENING (SEEN FROM PRECOL. ROOM)
GALLERY DOOR TO TOWER
Eugene Payette Architect
ROULEAU des CARTES Echelle - ¾"
DESSUS des TABLES des SALLES-de-LECTURE Echelle - ¾"
COMPTOIRS Ech - ¾"
RAYONS ISOLÉS de la SALLE-des-ARTS Echelle - ¾"
CADRES PIVOTANTS de la SALLE "CANADIANA" Echelle - ¾"
MEUBLES des QUOTIDIENS Echelle - ¾"
HISTOIRE
TYPE des RAYONS Echelle - ¾"
CATALOGUE Ech - ¾"
TABLES des SALLES-de-LECTURE Ech - ¾"
TABLE des REVUES Echelle - ¾"
TABLE SALLE-de-DISTRIBUTION Echelle - ¾"

MONTREAL PUBLIC LIBRARY. EUGENE PAYETTE, ARCHITECT.

The New License or Registration Law for Architects Now in Force in the State of Illinois

It Abolishes the Old Board of Examiners and Its Officers, and Puts the Enforcement of the Law into the Hands of a Director of Registration and Education, Who is Not an Architect, and Has the Same Authority over Twenty Other Departments Comprising the Department of Registration and Education; in the Performance of Which Function he is Assisted by Committees of Architects Nominated by the Regular Organizations of Architects Within the State.

By PETER B. WIGHT, F.A.I.A.

From the "Journal of the American Institute of Architects."

THE examination and licensing of architects in the State of Illinois, and the regulation of the practice of architecture as a profession is no longer the legal prerogative of a Board of Examiners consisting of five architects in that State. It is now the duty of *The Department of Registration and Education,* organized on the 1st day of July, 1917, under "An Act" passed by the present General Assembly *"in relation to the civil administration of the State government, and to repeal certain Acts named therein."*

This does not mean that there is any diminution of the effectiveness of the original Architects' License Law, with the various amendments which from time to time have been adopted to facilitate its better enforcement, but that the licensing of architects, and regulation of the practice of architecture as a profession, are to proceed from a higher authority than heretofore; one which should be more highly respected by the architects and the community than has been the case, and which is intended, if possible, to remove it from the taint of party politics, which formerly was possible.

ILLINOIS A PIONEER STATE.

The State of Illinois, as in much other progressive legislation, has been the pioneer in the United States in legislation for good architecture. The first license law was passed June 3, 1897, and had been in force since July 1 of that year, just twenty years, until the new *Civil Administration Code* became in force, July 1, 1917. This code is far-reaching in its effect. It has been agitated just four years, and in the form in which it was adopted has been under consideration for one year last past. It was first prepared by a commission appointed by the General Assembly of 1915, and it was the principal measure advocated by Governor Frank O. Lowden, in his canvass before the people, which resulted in his election in 1916 by a large majority of the popular vote. It was introduced early in the session of 1917, and took precedence of all other legislation. Governor Lowden took personal interest in it, and followed minutely every stage of the proceedings in the General Assembly. The interests of architects in the regulation of their profession, of structural engineers in theirs, and in public works and buildings by both, were of minor consequence in comparison with those of the State's charities, finance, agriculture, mines, public health, trade and commerce, and many other departments. Yet they have received careful attention, and the Governor called upon the organized associations of both architects and engineers to consult with him about the provisions of the Act which were of interest to them, and has accepted all that were reasonable. Hence the influence of both professions was exerted in behalf of its passage.

THE "CONSOLIDATION" BILL.

The whole scheme was so great and comprehensive that it was evident to all that it was useless for any to seek any special favors. It was known as the "Consolidation" Bill, and its main purpose was to eliminate overlapping authority and to bring together co-related departments of the Government, and all of them more directly into contact with the supreme executive authority which is vested by the Constitution in the Governor himself. A Governor who was not afraid to assume it was at the head of the movement. It may be of interest to know that, in this consolidation, twenty-four Acts and parts of Acts establishing governmental departments were repealed in this Bill; but the Architects' License Law was not repealed. Only the State Board and officers under the Board were abolished, and their authority vested in the director of one of the departments. But this Director of the Department of Registration and Education also has official authority over the business heretofore done by twenty other State boards and minor departments; and he is only one of nine department heads, who constitute the Cabinet of the Governor; and all are responsible to him.

A SKETCH OF THE NEW LAW.

A few extracts from the new law covering anything directly or indirectly relating to architects will probably make this digest more brief than a general description of its requirements. The same might also be said of those relating to structural engineering.

"*Section* 3. Departments of the State government are created as follows: (1) Finance; (2) Agriculture; (3) Labor; (4) Mines and Minerals; (5) Public Works and Buildings—this includes the office of the State Architect; (6) Public Welfare; (7) Public Health; (8) Trade and Commerce; (9) Registration and Education—this includes the registration of structural engineers as well as architects, each under its own Act.

"*Section* 4. Each department shall have an officer at its head who shall be known as a Director, and who shall, subject to the provision of this Act, execute the powers and discharge the duties vested by law in his respective department.

"The following offices are hereby created..............................

"Director of Registration and Education, for the Department of Registration and Education." In other parts of the Act, from information furnished by the Governor's office, it appears that the officers of this department are as follows:

Director, Francis W. Shepardson, Chicago, Salary, $5,000.00.
Assistant Director, Ernest A. Wreidt, Chicago, Salary, $3,600.00.
Superintendent of Registration, Fred C. Dodds, Springfield, Salary, $4,200.00.

"*Section* 7. ....

"Neither the Director, Assistant Director, Superintendent of Registration, nor any other executive and administrative officer in the Department of

Registration and Education shall be affiliated with any college or school of medicine, pharmacy, dentistry, nursing, optometry, embalming, barbering, veterinary medicine and surgery, *architecture, or structural engineering,* either as teacher, officer, or stockholder, *nor shall he hold a license or certificate to exercise or practice any of the professions*, trades, or occupations regulated."

From this it will appear that no architect can have any executive authority in enforcing the law, as was the case formerly with the State Board and its officers. The professional relation of architects and the voice of organizations of architects will be explained later on. The same is the case with structural engineers.

"*Section* 16. The director of each department is empowered to prescribe regulations, not inconsistent with law, for the government of his department, the conduct of its employees and clerks, the distribution and performance of its business, and the custody, use, and preservation of the records, papers, books, documents, and property pertaining thereto."

This undoubtedly insures the preservation of all the records, papers, and filed documents of the State Board of Examiners of Architects accumulated during the last twenty years, all of historical value and precious for reference during succeeding years; but, as far as the rules of procedure of the old board, which were authorized by law, are concerned, it remains to be seen how far the Director of twenty-one subsidiary departments, who is not an architect and not technically acquainted with the usages of the profession, will renew and re-establish them for his own governance. They were the result of nineteen years of experience in executing the license law, were last amended in 1916, and published, with the last biennial report, in January of the present year. It will also be noted in the section above quoted that the Director has absolute authority to make such rules independent of the law under which the old board received its authority. It is expected, however, that he will pay due respect to the opinions of his predecessors in exercising this authority.

"*Section* 17. Each department shall maintain a central office in the Capitol building at Springfield, in rooms provided by the Secretary of State."

The former office of the State Board in Chicago was closed July 1, and all its records and property removed to the Capitol building at Springfield.

The following extracts from the new law have a more or less direct bearing upon the Acts of the State Board of Examiners of Architects during the last twenty years, and do not seem to contravert any of them. The court decisions upon the law will doubtless hold as if the whole of the old law were in force.

"*Section* 32. Whenever rights, powers, and duties, which have heretofore been vested in or exercised by any officer, board, commission, institution, or department, or any deputy, inspector, or subordinate officer thereof, are, by this Act transferred, either in whole or in part, to or vested in a department created by this Act, such rights, powers, and duties shall be vested in, and shall be exercised by, the department to which the same are hereby transferred, and not otherwise, and every act done in the exercise of such rights, powers, and duties shall have the same legal effect as if done by the former officer, board, commission, institution or department, or any deputy, inspector, or subordinate officer thereof. Every person and corporation shall be subject to the same obligations and duties and shall have the same rights arising from the exercise of such rights, powers, and duties as if such rights, powers, and duties were exercised by the officer, board, commission, department, or institution, or deputy, inspector, or subordinate thereof, designated in the respective laws which are to be administered by departments created by this Act. Every person and corporation shall be subject to the same penalty or penalties, civil or criminal, for failure to perform any such obligation or duty, or for doing a prohibited act, as if such obligation or duty arose from, or such act were prohibited in, the exercise of such right, power or duty by the officer, board, commission, or institution, or deputy, inspector, or subordinate thereof, designated in the respective laws which are to be administered by departments created by this Act. Every officer and employee shall, for any offense, be subject to the same penalty or penalties, civil or criminal, as are prescribed by existing law for the same offense by any officer or employee whose powers or duties devolved upon him under this Act. All books, records, papers, documents, property, real and personal, unexpended appropriations, and pending business in any way pertaining to the rights, powers, and duties so transferred to or vested in a department created by this Act, shall be delivered and transferred to the department succeeding to such rights, powers, and duties.

"*Section* 33. Wherever reports or notices are now required to be made or given, or papers or documents furnished or served by any person to or upon any officer, board, commission, or institution, or deputy, inspector, or subordinate thereof, abolished by this Act, the same shall be made, given, furnished, or served in the same manner to or upon the department upon which are devolved by this Act the rights, powers, and duties now exercised or discharged by such officer, board, commission, or institution, or deputy, inspector, or subordinate thereof; and every penalty for failure so to do shall continue in effect.

"*Section* 34. This Act shall not affect any act done, ratified, or confirmed, or any right accrued or established, or any action or proceeding had or commenced in a civil or criminal cause before this Act takes effect; but such actions or proceedings may be prosecuted and continued by the department having jurisdiction, under this Act, of the subject matter to which such litigation or proceeding pertains."

The following section provides for the abolition of about one hundred and twenty-five State boards, commissions, and offices comprising more than two hundred officials and two thousand employees. This is the most important feature of the so-called "Consolidation" Act, which is intended to simplify the whole system of State government by retaining those branches which are essential and preventing overlapping authority; abolishing offices long since found to be useless, among which were many sinecures which were only of political importance to those holding them. So far as concerns the architects' and engineers' boards, the boards themselves and the officers under them only, are abolished, and the laws under which they were appointed remain in force, their duties and authority only being transferred to the Director of the twenty-one offices comprised in his department including all of the professions and occupations heretofore regulated by law.

"*Section* 35. The following officers, boards, commissions, arms, and agencies of the State government heretofore created by law, are hereby abolished, viz.:—..

State Board of Examiners of Architects, State Board of Examiners of Structural Engineers, Secretary of the State Board of Examiners of Structural Engineers, Secretary-Treasurer of the State Board of Examiners of Architects, ...

The following extracts from different sections further pertain to the duties and authority of the

DEPARTMENT OF REGISTRATION AND EDUCATION.

"*Section* 58. The Department of Registration and Education shall have power:—

.. ..

"(4) To exercise the rights, powers, and duties vested by law in the State Board of Examiners of Architects;

(and of all the other State boards that are not abolished.)

"*Section* 60. The Department of Registration and Education shall, wherever the several laws regulating professions, trades and occupations which are devolved upon the department for administration so require, exercise, in its name, but subject to the provisions of this Act, the following powers:

"1. Conduct examinations to ascertain the qualifications and fitness of applicants to exercise the profession, trade, or occupation for which an examination is held; and pass upon the qualifications of applicants for reciprocal licenses, certificates, and authorities;

"2. Prescribe rules and regulations for a fair and wholly impartial method of examination of candidates to exercise the respective professions, trades, or occupations; ....

"6. Conduct hearings on proceedings to revoke or to refuse renewal of licenses, certificates, or authorities of persons exercising the respective professions, trades, or occupations, and to revoke or to refuse to renew such licenses, certificates, or authorities;

"7. Formulate rules and regulations when required in any act to be administered.

"*None of the above enumerated functions and duties shall be exercised by the department of registration and education, except upon the action and report in writing of persons designated from time to time by the director of registration and education to take such action, and to make such report, for the respective professions, trades, and occupations as follows*:

.. ..

"*For the Architects, five persons, one of whom shall be a member of the faculty of the University of Illinois, and the other four of whom shall be architects residing in this State, who have been engaged in the practice of architecture at least ten years.*

.. ..

"The action or report in writing of a majority of the persons designated for any trade, occupation, or profession, shall be sufficient authority upon which the director of registration and education may act.

"In making the designation of persons to act for the several professions, trades, and occupations *the director shall give due consideration to recommendations by members of the respective professions, trades, and occupations and by organizations therein.*

"Whenever the director is satisfied that substantial justice has not been done either in an examination or in the revocation of or refusal to renew a license, certificate, or authority, he may order re-examinations or rehearings by the same or other examiners.

"*Section* 61. All certificates, licenses, and authorities shall be issued by the department of registration and education, in the name of such department, and with the seal thereof attached."

This concludes a compilation of the sections and parts of sections in the Act, directly or indirectly referring to architects, and, in connection with all the clauses in the old law not eliminated by the Act, comprises the license, or registration law of the State of Illinois for architects as now in force.

THE ADMINISTRATION OF THE LAW.

I am advised by the Department of Registration and Education that it has not been determined yet what amount will be paid to the examiners of the various professions, but in the case of the architects it will not be less than $10 per day, as formerly provided for members of the State Board of Examiners of Architects. They will also receive their traveling expenses. There is an appropriation sufficient to pay for such services. The Director has power to determine the compensation. The Superintendent of Registration will have charge of all of the administration work in connection with the examining and licensing of the professions, trades, and businesses now being licensed by the State. He is subject to the orders of the Director of Registration and Education, who is the supreme authority in his department. The Superintendent of Registration simply is the head of a division in the Department and is subordinate to the Director.

The Department is authorized to establish branch offices in other parts of the State should it be necessary. Employees will all be under Civil Service rules.

Annual reports to the Governor, of all departments, will be made in December of each year.

CONCLUSION.

It must now be a comfort to those who hug to their breasts the delusive idea that the registration of architects is something more respectable and honorable than licensing them, to know that the architects of Illinois are now *registered* under this act. That is, they are *registered* because they were *licensed;* the license "permitted" them to be registered in the Department of Registration and Education. This is the proper use of the terms. But whether this is a licensing or registration law is a matter of little importance. The law confirms the acts of the old licensing board, and puts all architects under the authority and discipline of State officers. It is simply another step in the progressive legislation of 1897 which first gave architects a legal status in this country. Many of the States have followed, or tried to follow the lead of Illinois, but few of them have succeeded in doing it all. In several States such laws were introduced in Legislatures during the present year. Some were for licensing, some for registration. Some passed and some did not. Now their advocates will have another chance to sit up and make another study of Illinois' experience. New York got its registration law amended but it did not succeed in its main purpose, and get around the opinion of its own attorney-general, that a man who had called himself an architect could continue to do so, and could not be compelled to register. The law there only enables a man to be protected by calling himself a "Registered Architect," after he is registered. I can not see why anyone should want to call himself a "Registered Architect" if he did not want to be registered or could not get registered if he wanted to.

The Illinois architects are in good company because the new Department under which they are enrolled is not only a Department of Registration, but of *Education* also. It has authority over all educational matters in the State except the University of Illinois, which has a special and old charter; but the Department is already co-operating with it in certain matters, such as the Geological Survey. Some day this new department may take up the subject of architectural education, as recommended by progressive architects, which the Institute, the Chapters, and the architectural press have recently been discussing so extensively. It may establish colleges of architecture and other fine arts not controlled by the Trustees of the University. But as long as the feeling for co-operation continues its examinations may continue to be held at the University as has been the case for many years last past. It will be noted that one member of the examining committee must still be a member of the Faculty of the University.

The organized architectural associations are recognized in the new law. That means the Illinois Chapter of the Institute, which is a State Chapter, and the Illinois Society of Architects which is also a State organization. It is on their advice and recommendation that the Director of the Department must appoint all committees for conducting examinations for license or instituting trials for violation of the law.

This reform is the result of many years of dissatisfaction with the work of the old board of examiners—though not always expressed with due regard to justice—which never was entirely free from political appointees in its membership, and which for some years last past has lacked the respect and support of the best element in the architectural profession.

As the original law was an experiment, so also is this change, to a certain extent, an experiment. It will have to be tried out practically. The architectural profession now has an opportunity to exert a direct influence upon the enforcement of the law. If it is not a success its failure may lie at the door of the architects of the State and their organizations. Both have advocated its enactment.

Toronto Branch Library

As a result of its expansive policy which aims to provide library accommodations to meet the needs of all outlying districts, the Toronto Library Board, under the capable direction of Dr. Locke, the Chief Librarian, is steadily adding to its already well developed system of branch buildings. One of its newest structures is the High Park branch, which is typical of the three most recent buildings erected by the Board. The other two, the Wychwood branch, and the library at Kew Beach Gardens, are identical to this building in plan, and vary in elevation only in the material used. While similar in architectural character, they are distinct as a type and represent a departure from the traditional library, both in style and arrangement, being designed after the fashion of the Collegiate Grammar School of the seventeenth century in England.

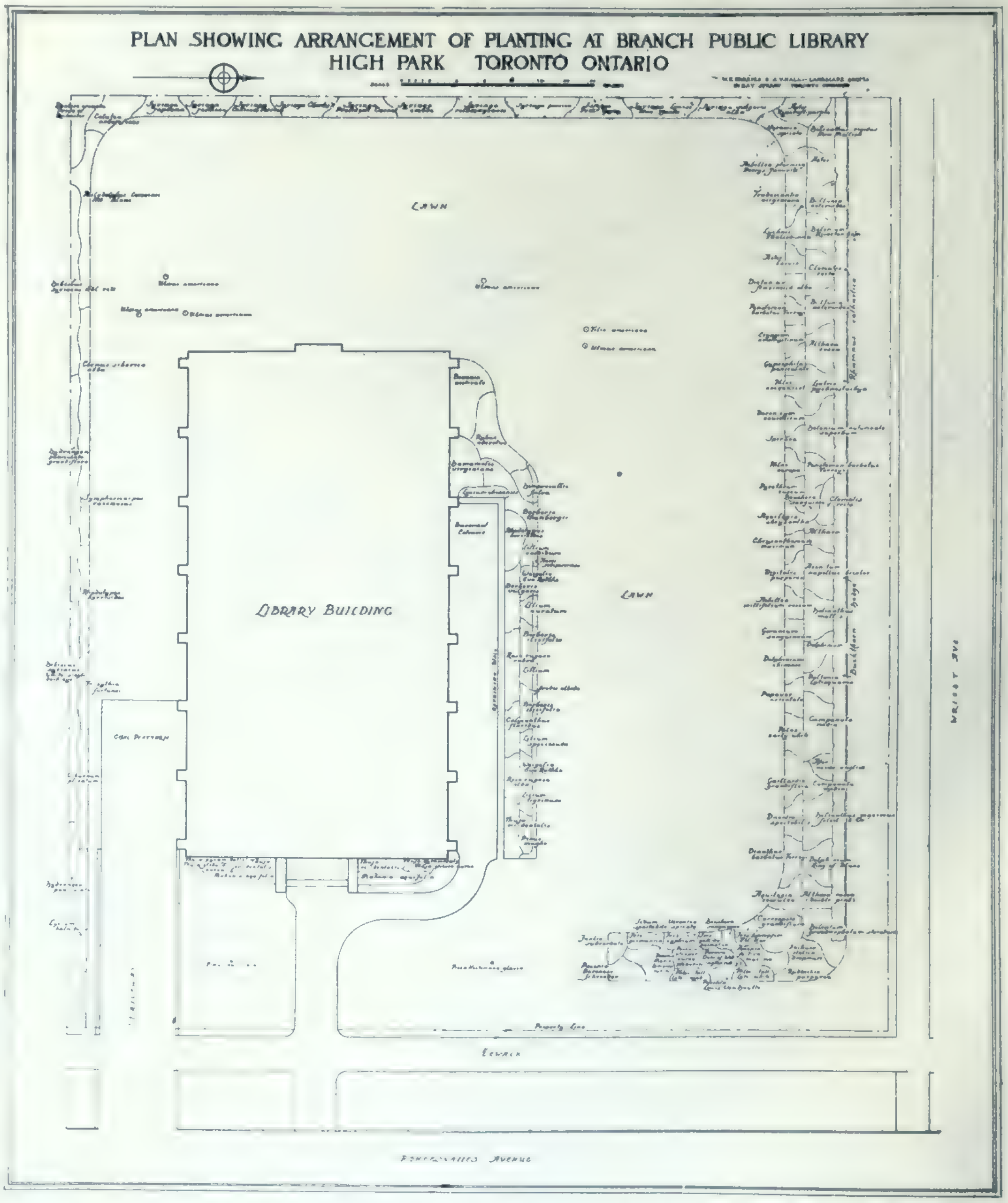
This type of library has been found to afford the maximum accommodation for books and readers at a minimum of expense for maintenance and supervision.

The plan consists mainly of two large rooms, with a compact grouping of the boiler room and minor services. The main reading room occupies the entire upper floor and has open timber trusses supporting the roof, with book shelves placed along the entire length of the two side and end walls. Owing to this arrangement the radiators are of the wall type, being situated immediately over the book cases, with leaded glass windows above admitting an adequate supply of natural light. The furniture consists of a supervising desk and simply designed tables and chairs, giving accommodation to six readers at each table.

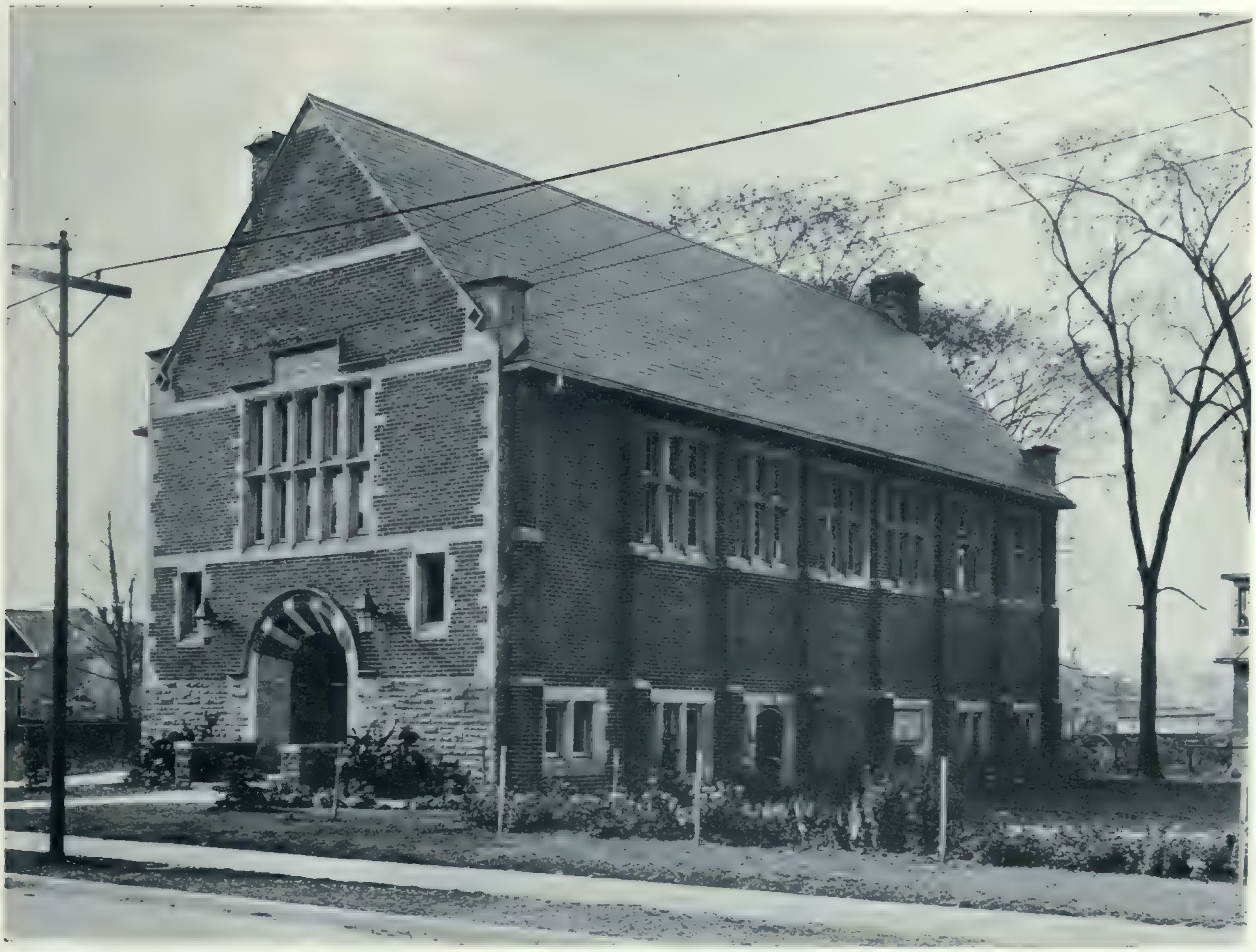
The room designated as Assembly Room on the ground floor plan, while available for the purpose of meetings, is principally used as a children's room, and is similarly furnished to the large room above, with the exception that benches are provided instead of chairs.

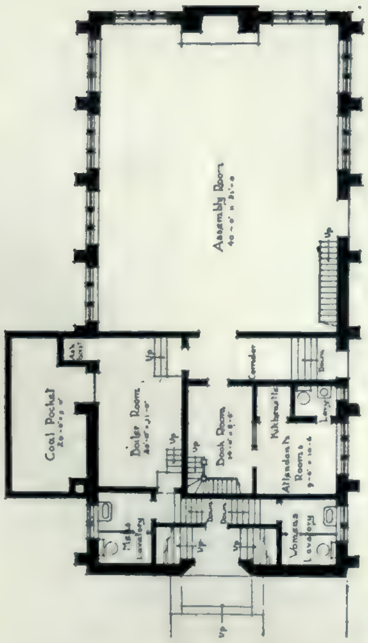
Both rooms have large stone fireplaces, and the scheme throughout is simple and restful, providing an atmosphere which is conducive to the purpose for which the building is intended.

The treatment of the grounds is explained in the plan shown below, and is also referred to verbally in the description of Toronto's branch library sites appearing in the following pages.

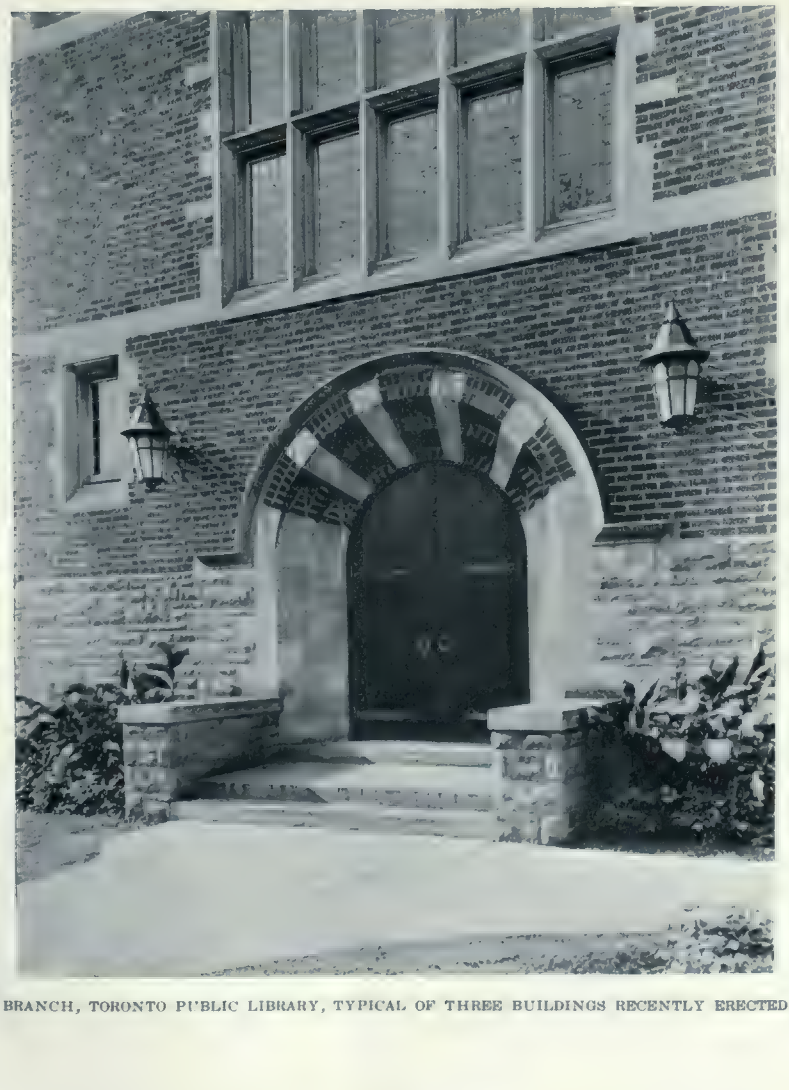

PLAN SHOWING ARRANGEMENT OF PLANTING AT BRANCH PUBLIC LIBRARY
HIGH PARK TORONTO ONTARIO
LAWN
LIBRARY BUILDING
LAWN

GROUND SCHEME, HIGH PARK BRANCH LIBRARY. W. E. HARRIES AND A. V. HALL, LANDSCAPE ARCHITECTS.

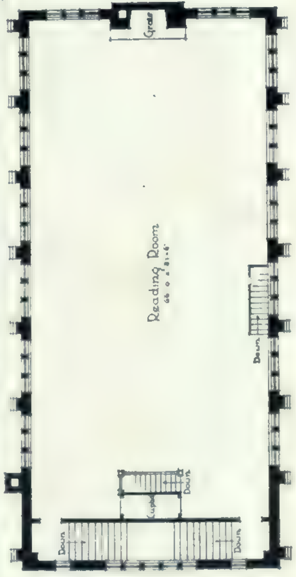




GROUND FLOOR PLAN.



DETAIL OF ENTRANCE.



UPPER FLOOR PLAN.

EDEN SMITH & SONS,
ARCHITECTS.

HIGH PARK BRANCH, TORONTO PUBLIC LIBRARY, TYPICAL OF THREE BUILDINGS RECENTLY ERECTED.

Toronto Branch Libraries Ground Treatment

ALFRED V. HALL, Landscape Architect

When the homes of the several branches of the Toronto public libraries were nearing completion, it was felt that if an individual treatment were possible for each site, the effect would be especially pleasing, as the buildings themselves were so similar. The physical nature of the surroundings helped to make such treatment possible.

GERRARD STREET BRANCH.

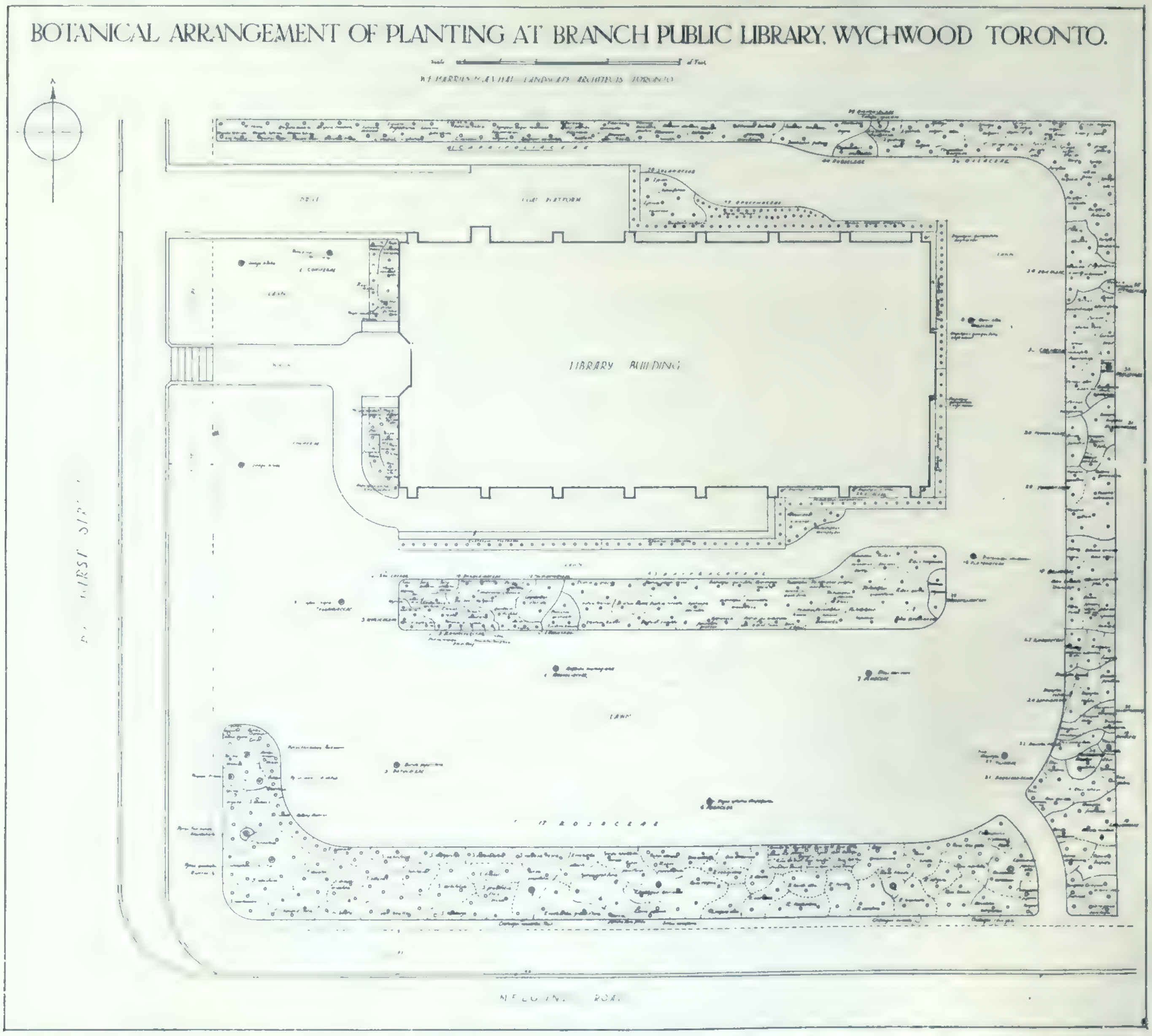
The site selected for this branch was small, and the greater part of it was required for the building. This limitation necessitated small shrub plantations as a background for the bulbs and bedding plants, from which the maximum amount of color could be obtained in the minimum space.

BEACHES BRANCH.

The lot on which the Beaches branch is located was small, but it is directly adjoining the Kew Beach Park. The natural treatment was to keep the grounds as part of the park by extending the park plantations of flowering shrubs around its boundaries, and the base of the building, thereby connecting in appearance the two branches of recreative life.

DOVERCOURT BRANCH.

This building was erected on a fair-sized corner lot, and was placed close to the restriction line on both sides. With this location a simple garden was made possible, consisting of a turf panel framed by a gravel path. Seats were placed along this path, and a border of shrubs and annuals were established between it and the boundary fence. The fence was of simple design, formed of 6-inch board pickets, with space


BOTANICAL ARRANGEMENT OF PLANTING AT BRANCH PUBLIC LIBRARY, WYCHWOOD TORONTO.
LIBRARY BUILDING
LAWN
ROSACEAE

GROUND SCHEME, WYCHWOOD BRANCH LIBRARY, TORONTO.

W. E. HARRIS AND A. V. HALL, LANDSCAPE ARCHITECTS.

between the pickets on the street side, and a close board fence on the two sides adjoining neighboring properties. Along the top of these projecting pickets in the closed fence, wires were carried, which served the double purpose of supporting a mass of Virginia creeper, and discouraging trespassers. In addition to the screen thus given it was necessary to plant Lombardy poplars in the border to hide the unpleasant elevation of the adjoining building.

This secluded garden provides a place where the children may take their books in good weather and enjoy additional freedom under care of one of the librarians or governesses.

MAIN READING ROOM, HIGH PARK BRANCH, TORONTO PUBLIC LIBRARY.

HIGH PARK BRANCH.

The Library Board was fortunate in securing a larger lot for the site of this branch, on which were several good-sized trees. The plan for the grounds provides for the maximum of unbroken lawn, and the feature of the planting is the long perennial border which parallels the street on two sides. A buckthorn hedge on the property line serves as a background, and discourages passage across the border. A narrow plantation of shrubs was placed along the one boundary fence to soften its formidable appearance from the lawn. Dwarf varieties of evergreens were used, in as far as practicable, around the entrance and steps, and the base of the building, to provide foliage in the winter, with groups of spring and summer bulbs planted among them to provide color in their turn.

WYCHWOOD BRANCH.

The site provided for the Wychwood branch is in the corner of a vacant block, and the suggestion of botanic arrangement of planting on library grounds seemed logical to the Board. This arrangement is being used frequently on the grounds of public buildings such as schools and libraries, where it is of distinct educational value, and on those of hospitals, government and private grounds, where it is a matter of more general interest.

The plan for this planting at this site was to be primarily for decoration, and the size of the lot restricted the bed area so that only one or two specimens of some varieties could be used. It was possible however, to represent forty-one

CHILDREN'S READING ROOM, HIGH PARK BRANCH, TORONTO PUBLIC LIBRARY.

botanical families, seventy-six sub-families, and two hundred and seventy-six varieties of these. Aside from the ordinary considerations of locating the shrubs with reference to their ultimate size, color of the flower, the season of bloom, and preference for sun or shade, care was taken to have the native variety represented, and each botanic family grouped together. This arrangement makes it possible for the student to find his subjects for study easily, for the visitor to be impressed at a glance with the wide range of varieties, and marked differences that often occur between the varieties of the same family; and to give the public the opportunity to see shrubs that they may wish for their own grounds labelled with both the common and the scientific names, thus making it easy to order what they desire.

It was possible to have the dwarf evergreens represented and grouped around the entrance, the viburnums and honeysuckles in the partial shade of the north fence, and the types commonly used for hedges in the hedge along the long area wall. The rose family, which is the largest family of shrubs, and is represented here by sixty-seven varieties, ranging from the astible alphabetically to the spirea, fills the bed the length of the south side of the property.

The botanical arrangement offers many difficulties, not only in the planning and planting, owing to the difficulty of obtaining the less common varieties true to name, and of replacing those that fail the first season, but also in maintenance, for ultimately, in such a small area, there will be only one representation of each variety, and that should be in its correct relative location after rearrangement. A gardener of more than average ability is required to care for it from year to year.

In spite of the difficulties involved there is no treatment of public grounds by means of shrubs or perennials that is so distinctly worth while from the standpoint of education, or more interesting to the general public, once they know of it, than plantations botanically arranged.

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FOUNDATIONS OF MONTREAL LIBRARY

The foundations for the Montreal Public Library were carried to bed rock, and consisted altogether of sixty-five circular concrete piers, five feet in diameter, and three piers of smaller size, making a total of sixty-eight piers carried to rock.

Generally speaking, the soil through which the piers were carried consisted of filled material and fine sand, gravel and hardpan, in layers of various thicknesses. Aside from the filling at the surface, there appeared to be no general stratification of the material, except that it was usual to find a few feet of hard pan immediately over the rock. The level of the rock itself varied between comparatively wide limits, the deepest pier being about sixty-five feet six inches, and the shallowest forty-seven feet, both measured from sidewalk level. As is general on the Island of Montreal, the rock surface was often found to be badly seamed and shattered, so that in many cases it was necessary to remove several feet of shattered rock before reaching a satisfactory foundation.

Owing to the monumental nature of the building, and to the fact that the interior contained a great deal of fine marble work, it was most essential that the foundations be so constructed that there would be absolutely no settlement, and on this account particular care was taken to secure sound rock; all loose material being carefully removed before concreting.

The piers were sunk by what is known as the "well" method; that is, the excavation as it proceeded was lined with vertical timber sheeting placed in sections about four feet deep, and held in place by means of iron bands. As the concreting proceeded, the iron bands were salvaged and used over again, but, owing to the fact that the piers passed through many layers of running sand, it was considered inadvisable to attempt to salvage the timber lagging, and it was therefore left in place, serving as a form for the concrete.

The basement walls of the building rested directly on the outside rows of piers and were themselves reinforced and converted into continuous girders to carry the weight of the walls between the adjoining piers. At one or two points where openings through the walls interfered with the girder action, steel spandrel beams were used, but generally speaking, the walls themselves reinforced to act as spandrels, resulting in a considerable saving in cost due to the elimination of the usual heavy steel girders.

All of the foundation work, including the basement walls and the retaining walls, was carried out under the supervision of The Foundation Company Limited, of Montreal, and notwithstanding the fact that the construction was carried on throughout the winter, exceeedingly good progress was made. The work on the foundations was commenced on November 4th, 1914, and the excavation for the piers proper was commenced on November 16th. The last pier was completed on March 6th, 1915; all of the sixty-eight piers being constructed in approximately ninety days, exclusive of Sundays and holidays, or at the rate of somewhat better than two piers every three days.

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Fire losses in Canada and the United States during the month of October $26,384,450, as compared with $17,701,385 for the same month of last year.

Commercial Buildings and Air Raid Attacks

THE question as to the capability of modern commercial buildings to resist the attacks of bombs dropped during enemy air-raids, says "The Builder," London, has again been raised by the renewal of enemy aerial activity over the heart of London during the last few months.

The bombs dropped are generally of two varieties, "high explosive" and "incendiary."

The damage done by the latter is comparatively negligible, except where they are dropped upon very old buildings which are chiefly constructed of timber.

When a high explosive bomb is dropped from a considerable height and falls upon the roof of a building constructed of a relatively strong and resisting material, such as concrete or reinforced concrete, the magnitude of the explosive effects depends almost entirely upon the percussion fuse; if this fuse is so delicately constructed that immediately the nose of the bomb strikes any comparatively hard and solid obstacle it ignites and explodes the charge of high explosive, the damage generally will be confined to projections above the surface of the roof, such as parapets, chimney stacks, lantern lights, vent pipes, water tanks, etc., etc., and the roof itself may only be slightly damaged at the point where the bomb fell.

On the other hand, should a very short period of time elapse between the moment when the bomb collides with the roof and the moment when the charge explodes, it is almost invariably the case that the bomb will penetrate the roof and possibly one or two floors, the depth of penetration depending, of course, upon the length of the short interval of time between initial collision and explosion.

The bombs dropped during the enemy daylight aeroplanes raids are of necessity much lighter than those dropped during the night Zeppelin raids, but even these lighter bombs, which weigh about 120 lbs., have when dropped upon a roadway, penetrated to a depth of over six feet.

It is the late-exploding or faulty bomb that we have to deal with in modern building construction, but it is extremely doubtful if any economical method of construction can be evolved which will render a structure bomb-proof without adding considerably to the cost; in fact, it does not appear to be a good policy to take into account the effects of bomb attacks when designing, for the simple reason that what would be satisfactory to resist the small bombs of today would certainly not resist the enormous bombs of the future.

Again, the number of buildings damaged in an air-raid is so small compared to the number of the surrounding buildings which escape, that the cost of rebuilding a damaged structure would be considerably less than the enormous cost to building owners should all buildings require to be sufficiently strong to adequately resist bomb attacks.

The design of bomb-resisting structures would also adversely affect the architectural features and aspects of our magnificent buildings and towns, and for that reason alone is to be unhesitatingly condemned.

We have seen the depressing effects of scientifically designed structures to resist the effects of Nature's causes in the new earthquake buildings of Jamaica; and yet Belgium, the cockpit of Europe, a country which has experienced more wars and the depredations due to war than any other country, is one of the richest—if not the richest—in examples of old and inspiring architectural treasures, and even up to the present in this war the damage done to her priceless buildings of antiquity is only local and on the whole not considerable.

It may be of interest to give a few figures to demonstrate what we should have to contend with if we had to design buildings strong enough to withstand present-day bomb attacks.

The average weight of the bombs dropped during the recent air raids is, as stated, about 120 lbs., and the estimated height from which they were dropped is about 13,000 feet.

The accumulated work developed by the bomb during its fall is equal to 120 lbs. multiplied by 13,000 feet, which equals the enormous figure of 1,560,000 foot lbs., neglecting the reduction due to resistance to bomb caused by wind, air, and to the bomb being dropped with an initial horizontal impetus, which resistance is designedly very small. This accumulated work is equivalent to that of a bomb weighing 696 tons dropping one foot.

The velocity of the bomb at the moment of impact would be about 915 feet per second, or about 624 miles per hour.

An interesting example of a case where the bomb dropped exploded at the instant of impact, occurred during the raid of July 7, 1917.

The bomb fell upon a roof constructed of reinforced concrete, blew portions of the parapets into the areas of and upon the buildings of adjoining owners, disintegrated the concrete for a space of about 6 feet by 8 feet (the fall of this concrete causing a hole about 15 inches square in the floor immediately under), perforated a water-tank on the roof like a seive, punched holes through the handrailing on the parapets, ventilating pipes and chimneys, shattered the glass in the roof skylights, and caused the whole building to rock and thereby develop cracks at the right angle connections of party and external walls. The lintel joists, being bound to the roof by continuity rods, were bent laterally, but not displaced, and some of the rods were forced down and round at an angle of 180 degrees, and the impact of the rods in bending made indentations in the ceiling of the roof in the centre of the slab.

None of the rods were damaged by the explosion beyond being bent, and in some cases the hooked ends being opened out.

The most important conclusion to remember from this example is that the roof did *not stop* the bomb, but exploded it, and thus the inmates of the building had a fortunate escape; had the bomb been "late exploding," without doubt the destruction would have been much more serious.

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EDUCATION OF THE ARCHITECT

(From The American Architect)

English architects during the past year have in their deliberative bodies, particularly the Royal Institute, given much time and serious discussion to the problems pertaining to architectural educational methods.

With perhaps more thorough and well grounded methods than exist in any country excepting France, there appears to be a very decided tendency toward a careful consideration of every suggestion that will serve to further improve the form of education for the practice of architecture.

There is apparent a strong feeling towards the adoption of some course that will make it possible to discourage the continuance of study on the part of students who have shown that they lack the essentials of success in the profession of architecture and to find a way to place such "misfits" in another course of study more suited to their abilities.

When a student is for one reason or another drawn into a profession for which he is obviously unsuited, it not only serves his own interests but those of the profession as well if he can be induced to seek other fields in which he would be more qualified to work.

Every man knows how difficult it will be to accomplish this purpose. The discussions in the Council of the R. I. B. A. take this condition into full account, but there does not appear to have been advanced any method that would successfully accomplish this transplantation of professional misfits.

Professor Lanchester, the Chairman of a recent R. I. B. A. conference, expressed the opinion that in a certain sense the education for the profession of architecture could not begin too early, that the development of the faculty of observation, essential in every phase of art education, should be nurtured and developed as soon as it appears. Trained observation is undoubtedly the basis of all success in the practice of any form of art, but unfortunately this faculty is too often dwarfed or smothered by educational methods that, although honestly devised, often rob the student of a power, the cultivation of which is the very essence of his future success.

Professor Lanchester's contention that the cultivation of the highest power of observation is the first and greatest essential in architectural education is undoubtedly correct, as is also his opinion that specialized training may come comparatively late. It is the introduction of such specialization in the early years of an art education that hampers the future progress of the student.

Mr. A. E. Richardson, in the course of one of these conferences, advanced the opinion that the investigation of history as an aid to accomplishment in the practice of building should proceed on the lines of adaptation of modern needs. He contended that it was the "family likeness" of all building evolved during the past three thousand years that should be brought to the attention of the student. He also urged that marked developments, such as the classics of Greece and Rome, the idylls of the Renaissance, and the modern classics of Europe and America should receive fuller attention than they do at present.

To quote from Mr. Richardson's remarks: "This attention is essential if we are to advance either in construction or design, and just as the parallels of the classics in literature offer consolation to us in these times, so the buildings of the past can be referred to, to inspire confidence for the future."

Throughout all the arguments advanced during these important conferences, there constantly appears the desire to give highest training to the development of the power of observation. In short, this would seem to be the great essential. It is believed that no system of education in any phase of art excels that produced in France, where it is the custom for students to be taken to great modern buildings "there to observe the mysteries and workings in being of those buildings," and to learn by actual observation the reason for specific things that have been introduced into the plan, or that are suggested in the design.

Reference has been made heretofore to the method of instruction in art pursued in Paris more than seventy years ago by Boisbaudran. The fact that the first and greatest essential of this feature was the training of the memory in art, and that there came from his atelier a great many men who achieved the highest position in their profession, would seem to prove that any form of education in art that fails to recognize the necessity for the development of every power of observation and the retention of things observed, is lacking in the essentials of well grounded preparation to insure future success.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

Αρχιτεκτονία

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Technical Training and Opportnnities

In his very interesting and carefully thought-out paper on "Why the Practice of Technical Professions in Canada Should be Regulated by Law," Mr. J. P. Hynes presents an argument which strongly advocates for progressive measures of polity in reference to the subject which he discusses.

The contention put forth that the opportunities for technical practice in Canada should be conserved for resident practitioners and those whom the Government through its system of education aims to qualify for such work, is something which on both logic and economic grounds is entitled to full support.

Obviously one of the fundamental objects of the state is to provide an educational system which will in all lines of endeavor qualify men to meet the community's needs. The more involved or complex its social and economic life becomes the more does each province owe it to itself to train and equip men who can intelligently and successfully grapple with the problems that arise. Along with this object it is the duty of the Government to see that the opportunities for practice within its jurisdiction are protected from undue outside encroachment in order that its system of education might give practical and efficient results. That architecture, engineering and other branches of technology come fully within this meaning, is evident in the fact that they are basic branches of service necessary to the community's progress and development.

Unfortunately, however, as regards these professions, Canada finds herself in a somewhat anomolous position. While educational facilities for technical training, and which now in Ontario and most other provinces include a university course for architectural training, have been established, nothing has been provided in the way of legislation to give the member of these professions a legal status. As a result the tendency has been not only to lower the standard of practice by subjecting resident practitioners to unwarranted and unfair alien competition, but also owing to this condition to place the graduates of Canadian universities under the necessity of exploiting their educational advantages elsewhere, thus depriving the community of the services of those who have been specially trained to do a particular work.

In view of this situation, Mr. Hynes' plan is both remedial and progressive. While the suggestion he puts forth refers to the Province of Ontario, its principle can be applied generally to all other provinces.

The proposal is to have the Government establish in the Department of Education a Registrar who shall register all present resident practitioners of technology in the Province, and after the date of the first registration, all graduates in technology from the universities of the Province and such others who, on becoming residents of the Province, comply with the provisions set out in an Act which would control the practice of technology in all its branches.

While this recommendation may not be generally accepted, it is nevertheless the growing concensus of opinion that it offers the only sure way out of the present unsatisfactory state, and would have the effect of placing the control of technical practice where it rightfully belongs.

This much at least is certain, that education in itself is only means to an end. The end must exist in the way of opportunities which it is the duty of the Government to conserve. Unless technical professions are given by legal protection the same encouragement to high attainment as is given to medicine and some of the other professions, and likewise are accorded full advantages to practice which are inherently theirs, the Government fails in the fulfilment of an important economic obligation and operates against its own educational facilities in providing the best results.

Canadian Building and Construction News

BUSINESS BUILDINGS.

Hamilton, Ont.—Work is being carried out on the erection of a one-story brick and concrete office building, to cost $5,000, for Proctor & Gamble Company, soap manufacturers, Burlington street.

London, Ont.—The Huron & Erie Mortgage Corporation, 442 Richmond street, have purchased a site on Market square, with a view to having plans prepared for a bank and office building, to cost $25,000.

Ottawa, Ont.—General alterations, including the installation of a new front, are being made to the store building of Beament & Johnston, Sparks street, to cost $4,000. W. E. Noffke, Central Chambers, is the architect, and W. G. Adamson, 126 Sparks street, the general contractor.

Ottawa, Ont.—The following contracts have been awarded in connection with a new $65,000 office building now being erected on Sparks street for R. L. Blackburn, Union Bank Building: Brick, Prairie Brick Company, Montreal; fireproofing, McFarlane-Douglas Co., Ltd., 250 Slater street; elevators, Otis-Fensom Elevator Co., 254 Queen street. Millson & Burgess are the architects.

Ottawa, Ont.—The following contracts have been awarded for a brick store building, costing $5,000, to be built on Rideau street, for Miss Tormey, Laurier avenue east: General contractor, S. F. Smith, 448 McLeod street; mason, E. B. Spence, 12 Foster street; steel work, Dominion Bridge Company; sheet metal, McFarlane-Douglas Co., 250 Slater street; heating and plumbing, W. G. Edge, Booth Building; plastering, Murphy & Morrow, Billing avenue; electric wiring, E. Tresidder, 58 Fifth avenue; painting and glazing, Geo. Higman & Sons, 188 Rideau street.

Penetanguishene, Ont.—Plans have been completed for a one-story brick office building, to be erected for J. B. Jennings; cost, $4,000. Work on the structure will not likely be started until spring. Charles P. Band, C.P.R. Building, Toronto, is the architect.

Toronto, Ont.—The Aberdeen Chambers, corner of Victoria and Adelaide streets, owned by Stinson & Hollwey, have been damaged by fire to the extent of $10,000.

Toronto, Ont.—Frank Stollery has taken a new lease on the southwest corner of Yonge and Bloor streets for a period of twenty-one years, and intends to erect a block of stores and offices to cost $100,000, in about a year's time.

Toronto, Ont.—F. W. Woolworth Co., Ltd., 4 Queen street east, have commenced operations on the erection of a two-story brick building, 40 x 110 feet, to contain store and offices, on Danforth avenue: cost, $15,000. S. & L. S. Yolles, 67 Baldwin street, are the architects and general contractors.

CHURCHES AND SCHOOLS.

Barrie, Ont.—Tenders will be received by the Board of Education until November 20th, for the whole work or separate trades required (1) for the erection of a new collegiate, to cost approximately $85,000, according to plans prepared by Architects Ellis & Ellis, Manning Chambers, Toronto; (2) for the reconstruction of the old collegiate at an approximate cost of $80,000, according to plans prepared by W. W. LaChance, Hamilton.

Courville, Que.—Work is in progress on the rebuilding of the Catholic Church which was destroyed by fire last January. It will not be necessary to rebuild the walls, as these are in good condition. The rest of the work will consist of reinforced concrete, cut stone, fireproofing, asbestos roofing, electric lighting, and hot water heating. Cost, $55,000. Joseph Goselin, Levis, Quebec, is the contractor.

Guelph, Ont.—The following contracts have been awarded for the erection of a chapel, to cost $3,500, on Eramosa road, for the Brethren Congregation, 200 Cardigan street: Painting and glazing, Reynolds & Son, Quebec street; plastering, J. J. Mahoney, Kent street; heating, plumbing and electric wiring, Stevenson & Malcolm, Wyndham street. W. A. Cowan, Kathleen street, is the architect.

Hamilton, Ont.—The following contracts have been awarded for the erection of a $15,000 brick addition to St. Joseph's Convent, Park street north: Mason, S. Howard, 231 Mary street; carpenter, Murray & Connor, 31 Lamoureaux street. Scott & Wardell, Sun Life Building, are the architects.

London, Ont.—Work has started on the erection of a soldiers' school, to be built at the Byron Sanitarium for the Military Hospitals Commission. Cost, $10,000. Watt & Blackwell, Bank of Toronto Building, and John Hayman & Sons, 432 Wellington street, are the general contractors.

St. Flavie, Que.—Plans have been completed in reference to a new heating system in connection with the restoration of the Roman Catholic Church, of this place. Mr. Pierre Levesque, 115 St. John Street, Quebec, is the architect.

St. Perpetue, Que.—Plans have been completed by Architect Pierre Levesque, 115 St. John Street, Quebec, Que., for church decorations and the installation of the heating system in connection with the Roman Catholic Church at this place. Estimated cost, $22,000. Rev. J. E. Rochette, Pastor.

Toronto, Ont.—The Board of Trustees of St. Monica's Church, Ashdale avenue, have decided to start operations shortly on the erection of an addition for Sunday school purposes.

Toronto, Ont.—The Modern Spiritualist Church, 124 Hallam street, has received tenders for the erection of a brick building, with a seating capacity of five hundred, to be built at 847 Dovercourt road.

Toronto, Ont.—Work is about to start on the erection of a brick Sunday school building at North Toronto, for the Salvation Army, to cost $6,500. Brigadier Gideon Miller, Salvation Army Headquarters, 64 Albert street, is the architect.

Toronto, Ont.—The general contract for the erection of a brick Sunday school building for the Salvation Army has been awarded to H. Freeman, 127 Oakwood avenue. Brigadier Gideon Miller, Salvation Army Headquarters, 64 Albert street, is the architect.

Walkerville, Ont.—Plans are being prepared for a hall and residence to be built for the Salvation Army, Clarence street. Cost $7,000.

Windsor, Ont.—The Board of Education has received competitive plans for a new school building, to cost $150,000.

CIVIL ENGINEERING.

Ottawa, Ont.—The Board of Control has instructed the Works Commissioner to prepare estimates for a new foot bridge over Rideau Canal, to replace the swing bridge leading to Ottawa East.

CLUBS, HOSPITALS, THEATRES AND HOTELS.

Kingston, Ont.—Plans have been prepared for the establishing of an additional building for the Military Hospitals Commission.

Kingston, Ont.—The Kingston Health Association has voted a sum for the erection of two small cottages on the Hotel Dieu grounds, for the care of tubercular patients.

London, Ont.—The following contracts have been awarded in connection with the erection of a $40,000 addition to the Rescue Home and Hospital of the Salvation Army, on Riverview street: General contractor, R. G. Wilson, 193 College street; carpenter, M. Southam; electric wiring, Benson & Wilcocks, 264 Dundas street; heating and plumbing, Noble & Rich, 237 Queen street east.

Toronto, Ont.—The Women's College Hospital and Dispensary have decided to erect an additional story to their new twenty-two room hospital building now being erected on Rusholme road. Gordon & Helliwell, Confederation Life Building, are the architects; Thompson Bros., Ryrie Building, mason contractors.

Toronto, Ont.—Plans have been completed and tenders invited for improvements to the King Edward Hotel, to cost $150,000. The property was recently purchased by the United States Hotel Company, in which Lt.-Col. Dinnick, 84 King street east, is interested. Work will consist mostly of renovations to the interior. Esenwein & Johnston, Ellicott Square, Buffalo, N.Y., are the architects.

Wellington, Ont.—The summer hotel (Alexandria Hotel) owned by Manley Sine, has been destroyed by fire; loss $9,000.

MISCELLANEOUS.

Galt, Ont.—Tenders have been received for a new building to be erected at Galt for the Merchants Bank of Canada. Hogle & Davis, 80 St. Francis Xavier street, Montreal, are the architects.

London, Ont.—The British Bank of North America has acquired a site on Market Square, with the intention, it is understood, of erecting a new bank and office building, to cost $50,000.

Ottawa, Ont.—Tenders have closed for installing an elevator in connection with the new city workshop.

Ottawa, Ont.—Tenders have closed for a new library building to be built from plans by Architect J. P. MacLaren, 104 Sparks street. The building will be of brick and stone construction, modernly equipped, and will cost about $20,000.

Toronto, Ont.—It is understood that the new lavatories at the Exhibition Grounds, which were postponed this year, will be built this coming spring. The work will cost $35,000. G. W. Gouinlock, 796 Yonge street, is the architect.

Toronto, Ont.—E. R. French, 57 Sunnyside avenue, has been awarded the general contract for the erection of a brick garage on Laplante avenue, for C. Lee, 18 Toronto street. Cost $12,000. J. A. Thatcher, 37 Cowan avenue, is the architect.

Toronto, Ont.—Architect D. C. Cotton, 54 Adelaide street east, has completed plans for a two-story garage, 55 x 125 feet, to be built at the corner of Shaw street and St. Clair avenue, for W. J. Barnett. The structure will be of brick and tile. Cost $15,000.

PLANTS, FACTORIES AND WAREHOUSES.

Arnprior, Ont.—Work is in progress on a one-story factory, 300 x 300 feet, of reinforced concrete, for the Arnprior Cabinet Company, Limited. Work is being done by day labor under supervision of owner. Richards & Abra, 126 Sparks street, Ottawa, are the architects.

Aylmer, Ont.—A. W. Pierce intends to immediately rebuild his large feed warehouse, which was recently destroyed by fire at a loss of $100,000.

Brantford, Ont.—Schultz Brothers Company, Ltd., have been awarded the contract for the erection of a four-story brick addition to Pratt & Letchworth Company's factory. Cost $3,500.

Brantford, Ont.—Work is in progress on a three-story, 40 x 60, brick warehouse, to be erected on South Market street for the Massey-Harris Company. Schultz Bros. have the general contract. Cost $50,000.

Brantford, Ont.—Architect W. C. Tilley, Temple Building, has awarded the following contracts for alterations to a factory on Bridge street for the Kitchen Overall & Shirt Company, 11 Queen street east: Mason, Thos. Harper, 14 Jarvis street; carpenter, H. W. Turner, 237 Wellington street. Work will consist mainly of new window frames and sashes and hardwood floors. Cost $8,000.

Georgetown, Ont.—One of the main buildings of the Provincial Paper Mill Company's plant at this place has been destroyed by fire, entailing a loss of $25,000. It is understood that the company will rebuild at once.

Hamilton, Ont.—Architect G. J. Hutton, Bank of Hamilton Building, has awarded the contract for the erection of a clearing house for the Frost Wire Fence Company, Sherman avenue, to W. H. Secord & Son, Brantford, Ont. The building will be of brick, steel and concrete, and cost $25,000.

Hastings, Ont.—The tannery of the Hastings Tanning Company, which is controlled by the Breithaupt Tanning Company, of Kitchener, Ont., has been destroyed by fire. Loss, including stock, $150,000.

London, Ont.—H. Hayman, 848 Dufferin avenue, has been awarded the general contract for the erection of a reinforced concrete blacksmith shop, for E. Leonard & Sons, York street, to cost $25,000. A. C. McBridge, 402½ Richmond street, is the architect.

Ottawa, Ont.—The following contracts have been awarded in connection with the ice plant now being built on Cooper street for the Ottawa Dairy Company, Somerset street: General contract, A. J. Garvock, 126 Lewis street; sheet metal, McFarlane-Douglas Co., Ltd., 250 Slater street; J. A. Ewart, Booth Building, is the architect.

Petrolia, Ont.—Work is in progress on a two-story concrete factory at Petrolia for the Colonial Knitting Company, Elmira, Ont. R. Kirkpatrick, Petrolia, is the general contractor.

Strathroy, Ont.—The Dominion Canners, Ltd., head office Hamilton, Ont., are preparing plans for a new factory to be built at Strathroy in the spring, at a cost of $100,000.

Temiskaming, Ont.—It is understood the Riordon Pulp & Paper Company, Limited, will shortly start the election of a sulphite plant, comprising several buildings, to cost $500,000.

Toronto, Ont.—The Bawden Machine Company, 163 Sterling road, is erecting a factory addition of frame and galvanized iron, to cost $4,000.

Toronto, Ont.—Plans have been completed for a one-story brick factory, to be built on Trafalgar street, for W. S. & F. G. Mahaffey, 16 Plymouth avenue.

Toronto, Ont.—Work is in progress on the erection of a brick printing office at 128 Broadview avenue, for Thompson Bros., 725 Queen street east. Cost $4,000.

Toronto, Ont.—Excavating has been completed for a warehouse to be built on Coxwell avenue, near Gerrard street, for the T. Eaton Company, Limited, at a cost of $65,000.

Toronto, Ont.—Work has started on a brick and mill factory to be erected at the corner of Grange and Spadina avenue, at a cost of $70,000, for L. Davis (in trust), Confederation Life Building. J. G. Kent and T. Essery, Confederation Life Building, are the general contractors.

West Lorne, Ont.—Plans have been completed for a one-story brick factory, to be erected for B. Weisbrood, West Lorne, Ont. Cost, $15,000.

PUBLIC BUILDINGS.

Brockville, Ont.—Work is in progress on a new hospital addition at this place. Mr. A. Stuart Allister is the architect. The contractors are as follows: general contractor and carpenter, F. B. Kerr; masonry and concrete, H. Watson; heating, H. S. Wright; plumbing, Geo. Ross & Co.; all Brockville firms. Plastering is being done by John Mander, Smith's Falls, Ont. Cost of work, $1,000.

London, Ont.—Moran & Son, Maitland street, have been awarded the contract for a one-story concrete addition to be erected in connection with the city incinerator plant on Waterloo street. Cost $3,000.

Ottawa, Ont.—Tenders have been received by the Department of Public Works for an extension to the East Block Departmental Building, to be used as a macerating plant.

Ottawa, Ont.—W. D. Edge, Booth Building, has been awarded the contract for installing a new heating system and plumbing at the Isolation Hospital. W. E. Noffke, Central Chambers, is the architect.

Sarnia, Ont.—Plans have been completed for a municipal incinerator plant, to cost $25,000. James, Loudon & Hertzberg, Excelsior Life Building, are the architects.

Unionville, Ont.—The town of Unionville is contemplating the erection of a new town hall and market building.

RESIDENCES.

Brantford, Ont.—A. J. Cromar, 448 Colborne street, has the general contract for alterations to apartments on Brant avenue, for Leslie S. Hall, 197 Darling street. Cost $4,000. Frank Nicholl, Temple Building, is the architect.

Galt, Ont.—P. Nichol has the general contract for the erection of a $3,800 brick residence for A. A. Beeton.

Hamilton, Ont.—Chas. Widdey, 972 King street east, is erecting a brick residence on Balsam avenue. Cost $3,000.

Hamilton, Ont.—Bell Bros., 445 Wilson street, are erecting a brick residence, to cost $4,500, on Belmont street, for W. J. Peppiatt, 37 James street south.

Hamilton, Ont.—Wm. Hill, 77 Mountain avenue, has been awarded the contract for a brick residence, to be built on Leinster avenue, for C. Lambert, 221 Balsam avenue. Cost $6,000.

Hamilton, Ont.—Tenders have been received for a four-story brick apartment house, to be erected on Queen street, for W. T. Dyment. Cost $30,000. F. W. Warren, Bank of Hamilton Building, is the architect.

Hamilton, Ont.—The following contracts have been awarded for the erection of a $6,000 brick residence on Gage avenue, for Martin & Martin, Sun Life Building: Mason, Mr. Klingbeil, Stevens street; carpenter, H. Thombs, 13 Whitfield avenue.

Hamilton, Ont.—Work is in progress on the erection of a $3,500 brick residence on Proctor boulevard, for F. Guest, 757 King street east, the following are the contractors: General contractor, J. M. Farewell, 53 Proctor boulevard; mason, Wood Bros., 159 Kensington avenue; carpenter, R. Spicer, 52 Proctor boulevard.

Hamilton, Ont.—The following contracts have been awarded for the erection of a $4,000 brick residence on Leinster avenue, for Horace Smith, 20 Lorne avenue: Mason, W. Smith, 233 Maple avenue; carpenter, M. Carver, 67 Aikman avenue; heating, J. Radigan, 46 Ferguson street; plumbing, Mr. Luxon, 451 Wilson street.

Hamilton, Ont.—The following contracts have been awarded for the erection of a $5,000 brick residence on Robert street, for Mrs. Munn, 33 Homewood street: General contractor, F. Babbige, 688 Concession street; plastering, J. Brown, Mountain Top; electric wiring, Jack Bros., 14 Wellington street; heating and plumbing, C. S. Avery, 24 Ashley street.

Hamilton, Ont.—The following contracts have been awarded in connection with a $4,000 brick residence to be built on Leinster avenue for Myles Carver, 67 Aikman avenue: Mason, W. Smith, 233 Maple avenue; heating, J. Radigan, 46 Ferguson avenue; plumbing, Mr. Luxon, 451 Wilson street; sheet metal, M. Smith, 11 Arthur avenue; plastering, W. Watson, Main street; painting, A. Warren, Catharine street; electric wiring, J. Dynes, 20 Avalon place.

Hamilton, Ont.—Work has started on a two-story brick residence, to be built on Carrick avenue for C. H. Roper, 81 Carrick avenue. Isbister Bros., 142 Emerald street, have the mason contract, and J. Poag & Son, Westinghouse avenue, are doing the carpenter work; cost $4,500. A brick residence, to cost $3,500, is being erected by Howard Bros., 164 Rosslyn avenue, for Mr. Trick, 3 Walnut street. The following contracts have also been awarded for the erection of a brick residence, to cost $5,000, on St. Clair avenue, for J. McNaught, 477 Wilson street: Sheet metal, Arthur Smith, 11 Arthur avenue; plastering, H. Tremolla, 729 Shannon street east; electric wiring, F. Thornton, 174 Balmoral avenue; plumbing, J. Kerr, 32 Sherman street north; heating, R. H. Low, 15 Bay street north. The same contractors are doing the trades for the $5,000 residence also being built for J. McNaught, 477 Wilson street, on Rosslyn avenue. The McClary Company, York street, have the heating contract.

Lindsay, Ont.—Work is in progress on the erection of a residence for Mr. Rhoda Slight, Cambridge street, to cost $3,500. Williams Bros. have the general contract.

Lindsay, Ont.—The following contracts have been awarded for the erection of a brick residence, to cost $3,000, for L. G. Williams: Carpenter, D. Sharp; plastering, Reeves & Way; painting and glazing, W. E. Godwin, Wellington street; heating, Boxall & Matthie, Kent street; electric wiring, W. E. Reesor. Excavation has also been completed for a $3,500 brick residence to be built by Thomas Arnold.

London, Ont.—Jas. Orme, 1010 Waterloo street, is erecting a brick residence, to cost $5,000, on Huron street.

London, Ont.—Jas. MacDonald, Duchess avenue, has the contract for the erection of a two-story brick residence, to cost $3,000, on Ridout street, for Mrs. Eggelton, 382 Ridout street.

Ottawa, Ont.—Plans have been completed for a two-story stucco residence, 29 x 31 feet, to be built on Willard street, for W. Fryer, 5 Glen avenue.

Ottawa, Ont.—Ferguson & Lambert, 643 King Edward avenue, have been awarded the general contract for the erection of a brick apartment house on Daly avenue, for Dr. Robert Law, 190 Laurier avenue east. Cost $13,000. J. A. Ewart, Booth Building, is the architect.

Ottawa, Ont.—Architects Richards & Abra, 126 Sparks street, have awarded the following contracts for the erection of a brick addition to a residence on Gloucester street, for Dr. A. E. Mahood, 171 Metcalfe street: General contractor, S. F. Smith, 448 McLeod street; mason, Wm. Campbell, 70 Spruce street; sheet metal, McFarlane-Douglas Co., Limited, 250 Slater street; heating and plumbing, W. G. Edge, Booth Building; plastering, Murphy & Morrow, Billing avenue; electric wiring, E. Tresidder, 58 Fifth avenue.

Toronto, Ont.—G. T. Death, 244 Sheldrake boulevard, has started work on a brick residence, to cost $3,500.

Toronto, Ont.—H. Lucas, 72 Bathgate avenue, is erecting seven brick houses, to cost $9,000, on Rhodes avenue, near Danforth avenue.

Toronto, Ont.—Muir & Lumb, 38 Hazelwood avenue, have started work on the erection of a brick residence on Strathmore boulevard. Cost $3,000.

Toronto, Ont.—Plans have been completed for a two-story brick residence, to be erected on Woodside avenue by J. Carlisle, 25 Woodside avenue. Cost $3,500.

Toronto, Ont.—Work has started on the erection of a brick bungalow on Kingswood road, for Morris Reid, Queen and Balsam streets. Cost $3,000. H. J. Chown, 220 Scarboro road, is the architect.

Toronto, Ont.—Henry Allen, 297 Huron street, has the general contract for the erection of a brick residence in Lawrence Park, to cost $4,500. W. Bredin Galbraith, Bank of Hamilton Building, is the architect.

Toronto, Ont.—Architects Oborn & Ellis, 22 College street, have completed plans for a residence, to be erected at the corner of Thorne and Burlington avenue, for P. L. Spears, 20 Biggar avenue. Cost $5,000. Owner is looking after all trades.

Toronto, Ont.—Architect P. H. Finney, 79 Adelaide street east, has completed plans for an eight-suite apartment house, to be erected at the corner of Gerrard street and Normandy boulevard, for W. A. McEachren & Sons, Ltd., Royal Bank Building. The structure will be three storys, 29 x 90, of brick construction, and will cost $20,000.

Toronto, Ont.—Plans have been completed for a brick residence and garage to be built on Sellers avenue for Wm. Naylor, 1970 Dufferin street. Cost $3,500. J. A. Trebilcock, 153½ Queen street east, has started work on the erection of a brick residence and garage on High Park avenue. Cost $6,000. Wm. Johns, 1 Leed street, will erect a $3,000 brick residence on Cuthbert crescent.

Toronto, Ont.—Work is in progress on the erection of two pair of brick houses on Bathgate avenue, for L. H. Lankin, 124 Hampton avenue. The owner is the general contractor, and J. T. Bowes, 45 Harcourt avenue, has the plumbing and heating contracts. A brick residence to cost $4,000 is being built on Greenwood avenue by the John Price Estate, 100 Greenwood avenue.

Toronto, Ont.—Jas. Skelton, 70 Laughton avenue, has started work on the erection of a brick residence on Dinnick crescent, to cost $4,500. J. Crang, 128 Hilton avenue, is erecting a garage and residence of brick construction at the corner of Alberta and St. Clair avenue. Cost $15,000. Plans have been completed for a residence to be built on Drury avenue for F. Hill, 18 Willard avenue. Cost $3,800.

Toronto, Ont.—A. J. Fish, 134 Millicent street, is erecting a two-story brick residence on St. Clarens avenue. Cost $3,000. A. & A. Grant, general contractors, 837 Logan avenue, have started work on a residence and garage of brick construction on Jackman avenue. Cost $3,500. Architect W. G. Hunt, Confederation Life Building, has completed plans for a brick residence to be built on Neville Park boulevard, for J. A. Hearst, 203 Willow avenue. Cost $6,000. The same architect has also completed plans for six brick houses to be built on Kew Beach avenue for the Crown Realty Company. Plans have been drawn for the erection of a brick residence on Weybourne crescent, for F. W. Hill, 226A Havelock street. Cost $4,000.

A LARGE ORDER FOR MARINE WORK.

It is understood that the firm of MacKinnon, Holmes & Co., Limited, have recently received from the Imperial authorities a large order for marine work which will keep their plant in operation for many months to come.

CATALOGUES and BOOKLETS

THE PURSUIT OF SAFETY.

"The Pursuit of Safety," issued by the Automatic Sprinkler Company of America, is a valuable booklet which according to its letter of introduction, "approaches the subject of automatic sprinkler protection for protection sake." It is pictorially interesting, splendidly printed and is more in the nature of a carefully prepared treatise on fire loss and prevention than a trade catalogue. The company maintains branches in most of the large cities and has its head office at 123 William Street, New York City.

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CANADIAN STEEL CASEMENTS.

A very practical idea is incorporated in the new catalogue which the Trussed Concrete Steel Company of Walkerville has just published on "Canadian Steel Casements." Aside from the excellent quality of its printing and illustrations, it is compiled in loose leaf form in order that the various details which are accurately drawn full size may be removed temporarily for the purpose of transferring same to the architects drawings. This gives it a most practical purpose and makes the catalogue of special value to any one specifying windows of the casement type. The catalogue contains thirty-two pages, 9 x 12 inches, of details and photographic subjects showing different style casements and examples of work already installed. Other sheets will be supplied to be added to the catalogue as new features develop or the occasion requires.

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GLASS GARDEN SUGGESTIONS.

"Glass Garden Suggestions" is the appropriate title of an artistic booklet of thirty-two pages recently issued by the Glass Gardens Limited, of Toronto, Georgetown and Montreal. It contains a number of illustrations of green houses and conservatories which this company has recently built including the greenhouses erected at Spencewood for the Lieutenant-Governor of Quebec, as well as a number of successful examples representing completed glass gardens and conservatories of both commercial and residential types. There is also a large amount of general information of value and a chapter devoted to the question of proper heating. The booklet is attractively printed on a light green tinted book stock bound in a dark green kraft paper cover, and in view of the increasing interest which is being taken in "hot house" culture offers a large number of very valuable suggestions.

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SWIMMING POOLS.

An attractive booklet entitled "Swimming Pools," has been issued by The Associated Tile Manufacturers, Beaver Falls, Pa. This booklet contains 32 pages of valuable information representing the latest and best practice in the design and construction of swimming and wading pools. The data furnished covers proper shapes and dimensions, together with methods of construction and details of waterproofing, drainage, overflow troughs, curbs and gangways. Reference is also made to various accessories such as steps and ladders, diving boards and shower baths.

The subjects of artistic merit, markings and color schemes are discussed and illustrated by numerous photographs of recent and notable installations. This booklet is distributed gratis to architects and prospective builders and will form a valuable addition to the reference library.

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PRACTICAL STRUCTURAL DESIGN.

Practical Structural Design. By Ernest McCullough, C. E. 303 pages, size 6¼ x 9 inches. Bound in cloth. Published by the U. P. C. Book Co., Inc. Price, $2.50. In this text and reference work, which is especially adapted to the needs of self tutored men, the field of structural design is well covered. The principles of moments, reactions, shearing stresses, elastic limit, modulus of rupture, etc., are clearly described. Practical problems in the design of girders, beams, trusses, etc., are presented, and the application of graphic statics to wind forces, stresses occurring in trusses, stresses in columns, stresses in structures, application of the radius of gyration, eccentric loading, wind bracing, etc., are all lucidly treated.

The author is a man of wide practical experience, and in his writing has the happy faculty of so expressing his thoughts as to enable the merest tyro to readily grasp his meaning. He is a licensed structural engineeer and licensed architect in the State of Illinois, and is a member of the American Society of Civil Engineers. His high professional standing and well-known literary ability bespeak for the work a warm welcome at the hands of those seeking information of the character presented.

◆

HOW HOUSES ARE EASILY WIRED FOR ELECTRICITY.

It is seldom any is built now-a-days without being wired for electricity. There are instances, however, where this does not happpen to be the case, and there are also many houses which were built before electricity became so generally used and which are without this great convenience. Just how these places can be made comfortable and modern is told in an interesting little booklet on "How Houses are Easily Wired for Electricity," issued by the Toronto Hydro-Electric System, 220 Yonge Street, Toronto. This booklet explains the simple method of how an entirely concealed system of wiring can be installed without marring the walls or doing any damage whatever, and without any disorder or confusion to the owner. It also contains the following summary showing the various household conveniences for which electricity can be used, and which suggest a number of items which can be considered by the architect or builder at a time a house is being planned, so that sockets and connections can be provided for every purpose.

An electrically equipped home means less drudgery for the housekeeper,

—And more comfort for the whole family.

An electric iron saves tiresome trips to the stove.

An electric washing machine will do an ordinary washing in two hours at a cost of two cents.

An electric vacuum cleaner thoroughly cleans carpets and draperies without disturbing the orderly arrangement of the house.

An electric heating pad is the only "hot application" that gives a gentle, soothing heat that is constant and even.

An electric toaster insures delicious toast, served hot and crisp as required.

An electric percolator makes coffee in the scientific way.

These little comforts cost only a nominal sum and they help to make home-life happy.

—But they can be enjoyed only in homes that are wired for electricity.

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CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings Featured in This Issue

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Plumbing Contractors, W. J. McGuire Co.
Plastering, John Quinlan & Company.
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CONSTRUCTION

December, 1917 Vol. 10, No. 12

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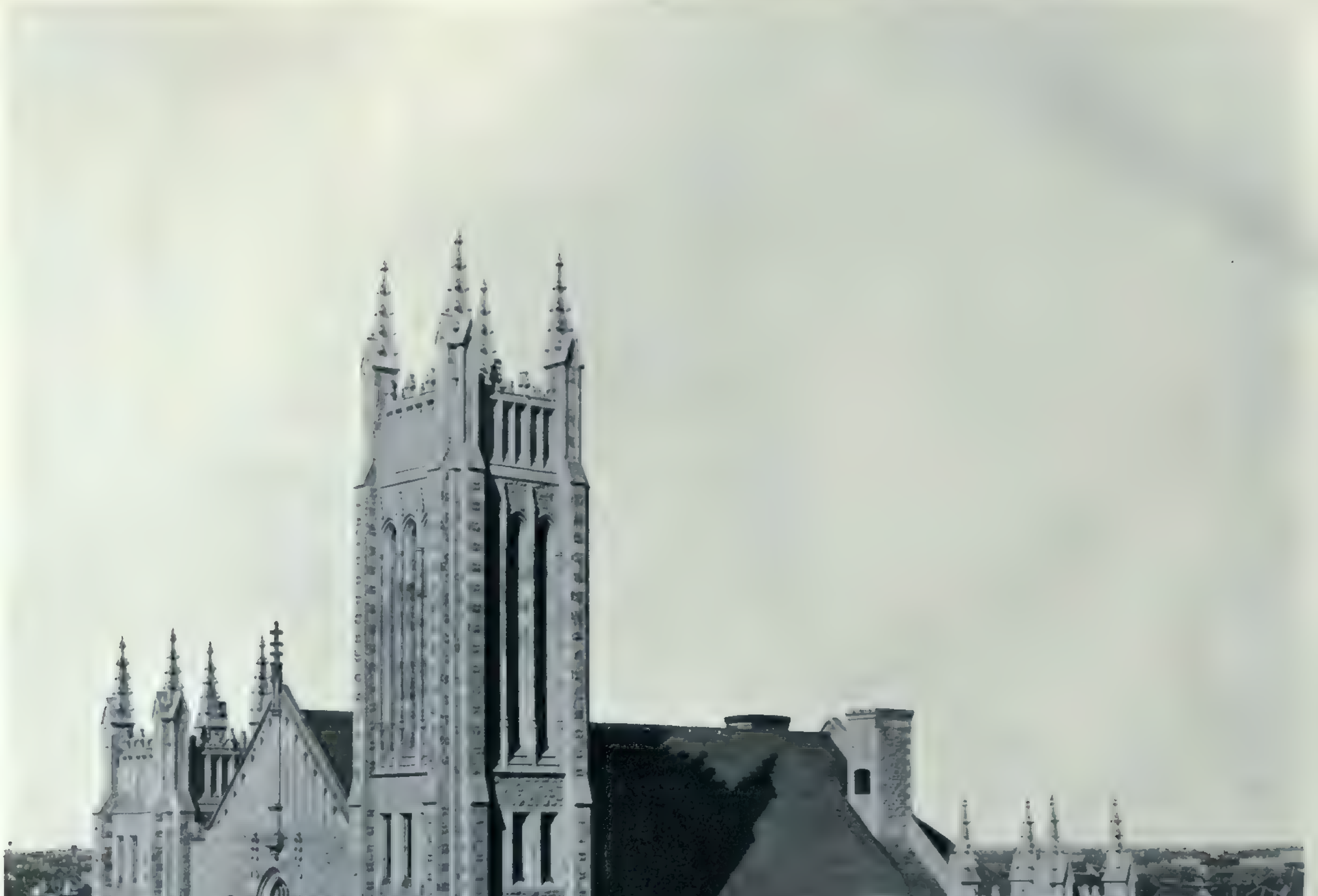


NEW KNOX PRESBYTERIAN CHURCH, WINNIPEG. J. H. G. RUSSELL, ARCHITECT.

NEW KNOX PRESBYTERIAN CHURCH, WINNIPEG

J. H. G. RUSSELL, Architect

The problem in mind in designing this church was to produce a scheme adaptable to the site, ideally located on the northwest corner of Qu-Appelle avenue and Edmonton street, and overlooking the Central Park. The Early English Gothic character of the exterior shows but little use of ornamental detail, the whole scheme depending largely for effectiveness upon its simplicity of treatment, and the judicious use of the Tyndall stone facework, which shows to advantage in the perpendicular lines throughout, and is especially exemplified in the towers.

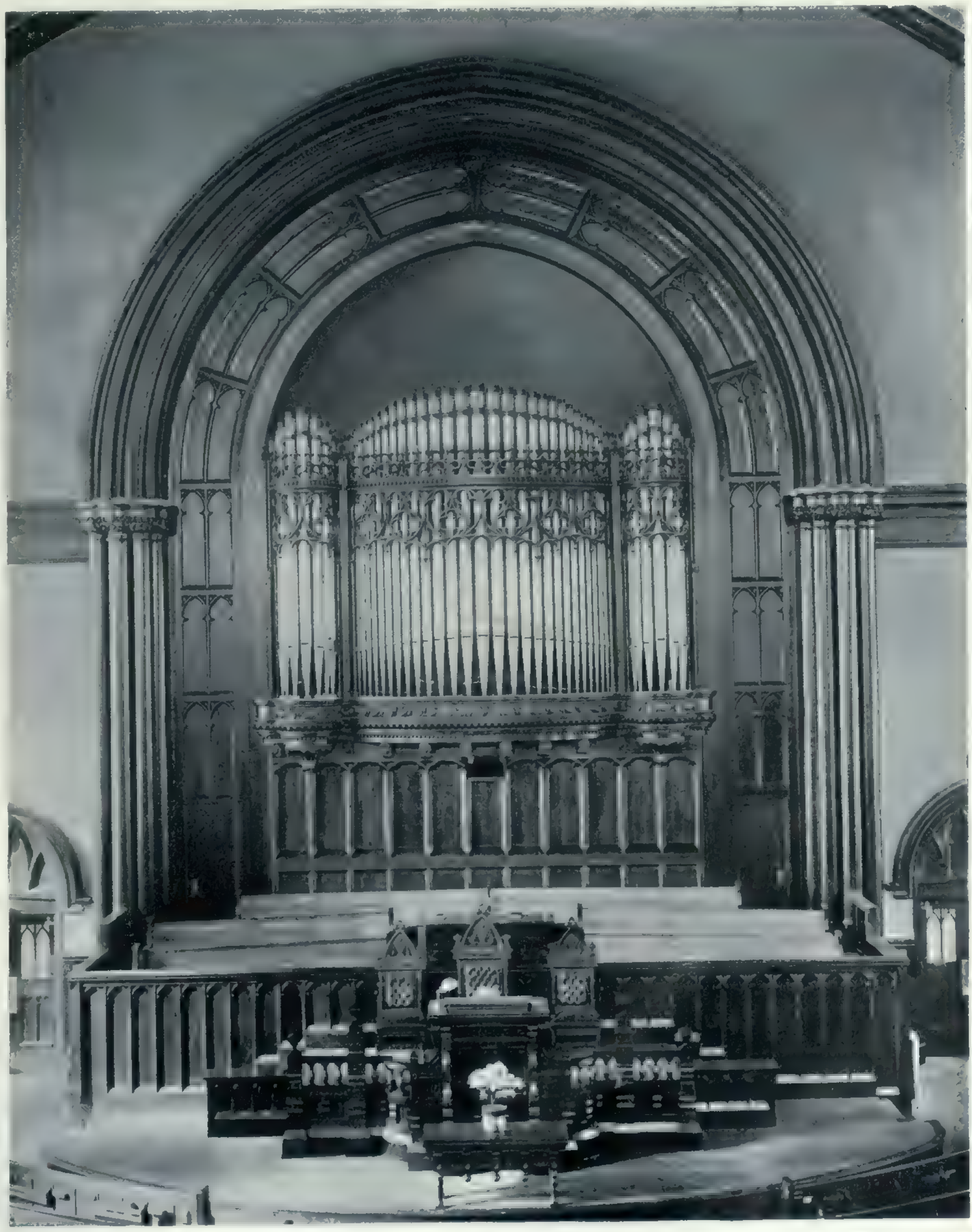
The main tower rises to a height of approximately one hundred and forty-six feet above the sidewalk, and from the entrance arched doorways to the large louvred arched openings around the belfry, terminating with pinnacled embattlement at the roof, the severe detail has been maintained throughout.

The interior construction of the church is of reinforced concrete, and the roof is carried on steel trusses. The interior finish is of birch, stained in walnut; the vestibules and foyer have tile floors with marble base, and the stairs to gallery are of reinforced concrete, with marble tread risers and strings.

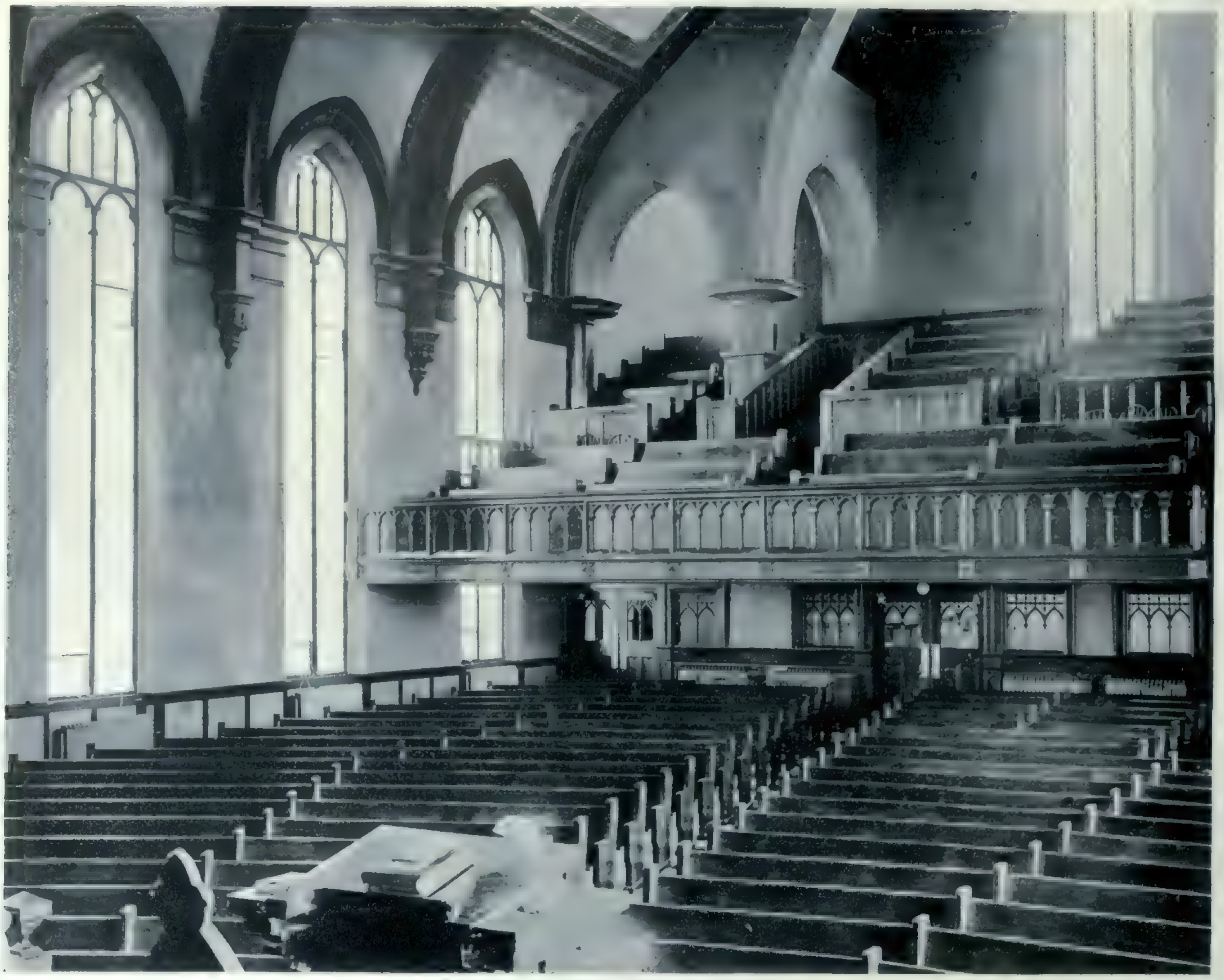
Broad flights of stone steps lead up to the entrances, that open into spacious vestibules, through which one passes into the foyer, which is large and comfortable and warm, and cheerful in color treatment, and is more than a passageway to and from the auditorium; it is also a gathering place after services and provides the means for social intercourse inside the church building, and nowhere is this more exemplified than in the arrangement of the gallery stairs. The dominant feature of the foyer is the Gothic screen, through which five sets of double doors give access to the main auditorium, eighty feet wide, and with a seating capacity for eight hundred and ten persons. The seats are run on a curved radius, set on a bowled floor, which allows of a clear vision to every occupant.

The gallery has a seating capacity for an additional four hundred and twenty persons, and is of reinforced concrete construction, supported by large cantilever beams, which eliminates the necessity of columns to support its eight-foot span over the auditorium.

At the north end of the auditorium a recessed apse encloses the organ, which was removed from the old building and rebuilt in new position. At each side, incorporated in the organ enclosures, are entrances to the choir, which is enclosed all round by a Gothic panelled rail. Another link with old associations is the re-erection in the new building of the pulpit from the old



DETAIL OF PLATFORM AND ORGAN, KNOX PRESBYTERIAN CHURCH, WINNIPEG.



AUDITORIUM, KNOX PRESBYTERIAN CHURCH, WINNIPEG.

church, with its rails complete, this pulpit platform being surrounded by a raised dais for communion table, and seats for elders.

The walls of the auditorium are broken up into vertical panels by large Gothic windows, through which a flood of light in mellowed tones of cathedral colored leaded glass adds brightness to the general design. The large triple windows on the south elevation are a special feature, and will admirably allow of memorial decorations in rich effect, without sacrificing the volume of light.

The arched ceiling of the auditorium rises to a height of approximately fifty-seven feet to apex, and the disposition of the ceiling ribs and main trusses is such as to produce a panelled effect well calculated to carry attention, the main rib terminations being incorporated in the cornice running around the church, with cast figure trusses.

The towers are carried by arches on octagon columns over galleries, thus giving a clear sitting area at these points, and obviating any break in the whole area of seating.

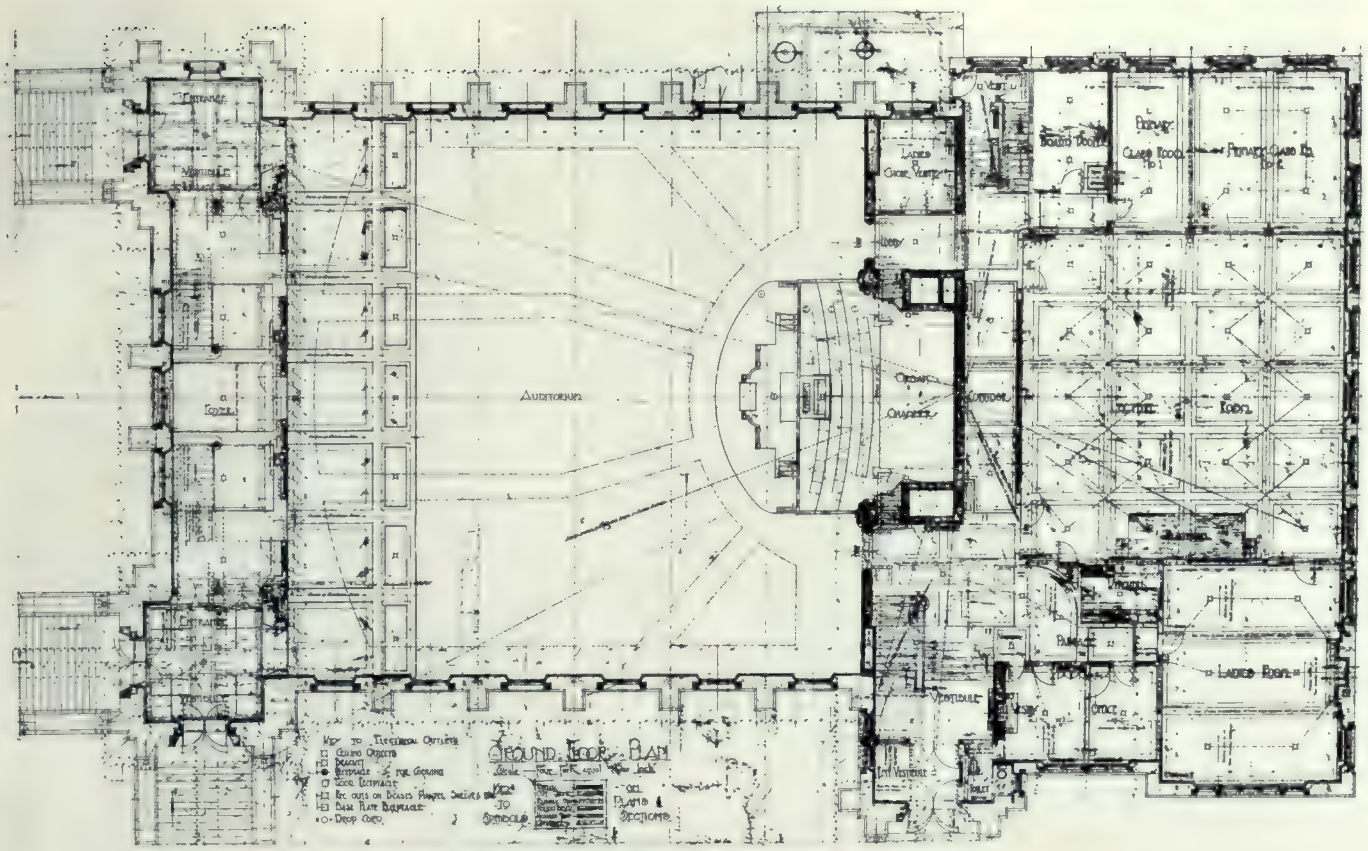
The lighting is derived from diffusers in ceiling panels carrying powerful reflectors. A necessary amount of semi-indirect light is provided under the gallery and in other parts of the church.

The Sunday school building is laid out to suit the special requirements of the organization, is easy of access, and, with a view to economy in working effort, from the close proximity of the choir vestries to the church to the privacy afforded the vestry and office, everything was planned to effect the purpose for which it was intended.

A large lecture hall on the ground floor can be augmented by taking in the two large primary class rooms, separated from each other and from the lecture hall by rolling partitions, thus providing a larger or smaller hall, as the occasion demands.

Adjoining the Sunday school is the girls' club room, with kitchenette, and a large committee room, while the school library is also on this floor. The uses for which the various rooms are intended naturally dictate their furnishings, which are simple throughout.

For social purposes, the basement portion of the Sunday school building is equipped with a large kitchen and servery, adjoining the social



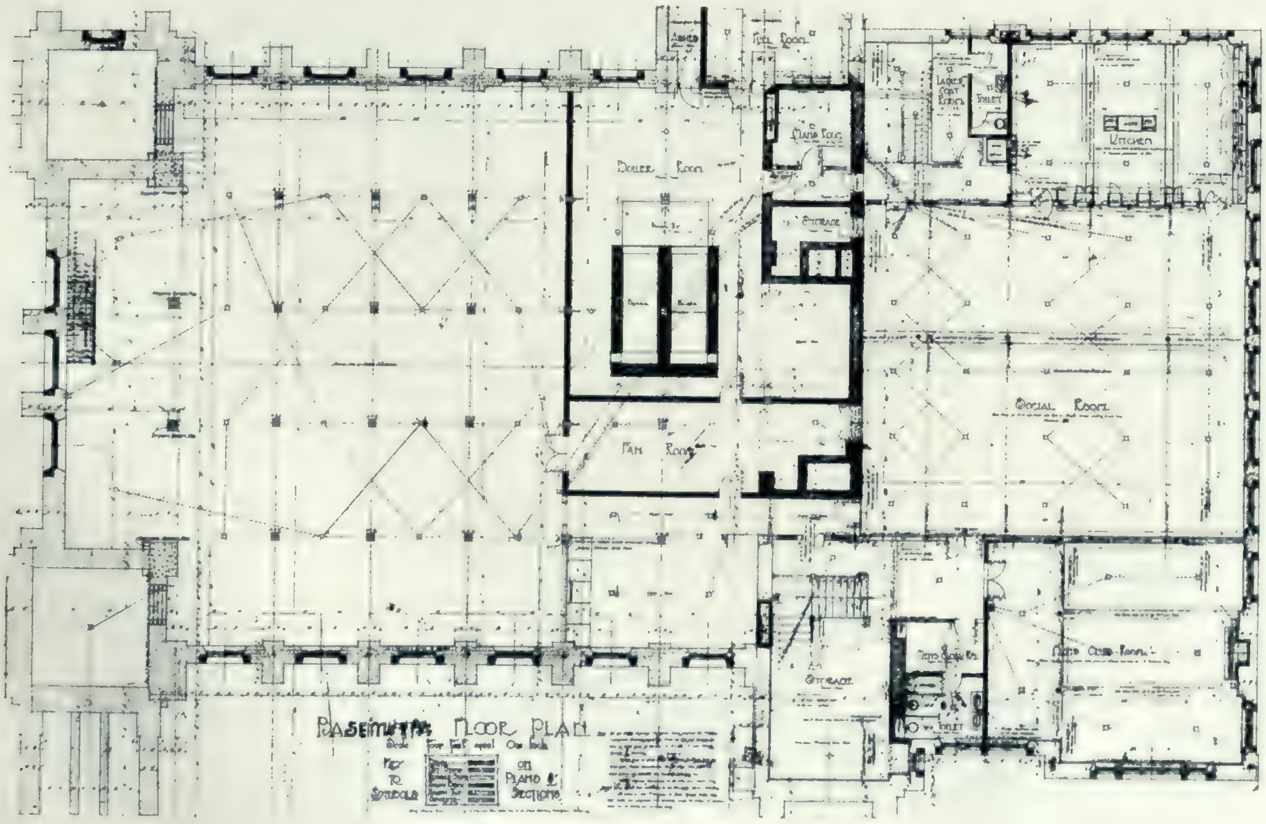
GROUND FLOOR PLAN, KNOX PRESBYTERIAN CHURCH, WINNIPEG.

hall, suitable for supper parties or other social functions. The men's club room is also located on this floor.

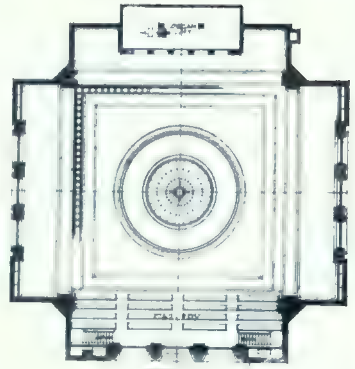
The heating apparatus and the ventilation systems are under the church auditorium, with fuel storage and ash bin with hoist, provision for shower baths is also made in this portion of the basement, the balance of this area being held over for sport activities.

Cloak and toilet rooms are provided on the different floors, and a system of semi-indirect lighting illuminates the building throughout.

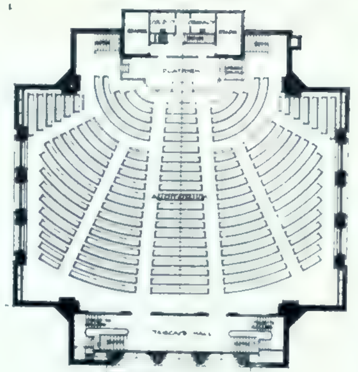
The cost of the structure, exclusive of organ, seating and furnishings, was about $240,000.



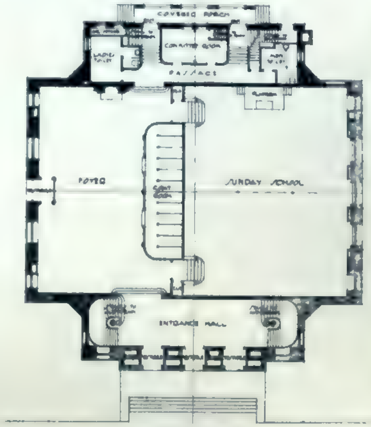
BASEMENT, KNOX PRESBYTERIAN CHURCH, WINNIPEG.



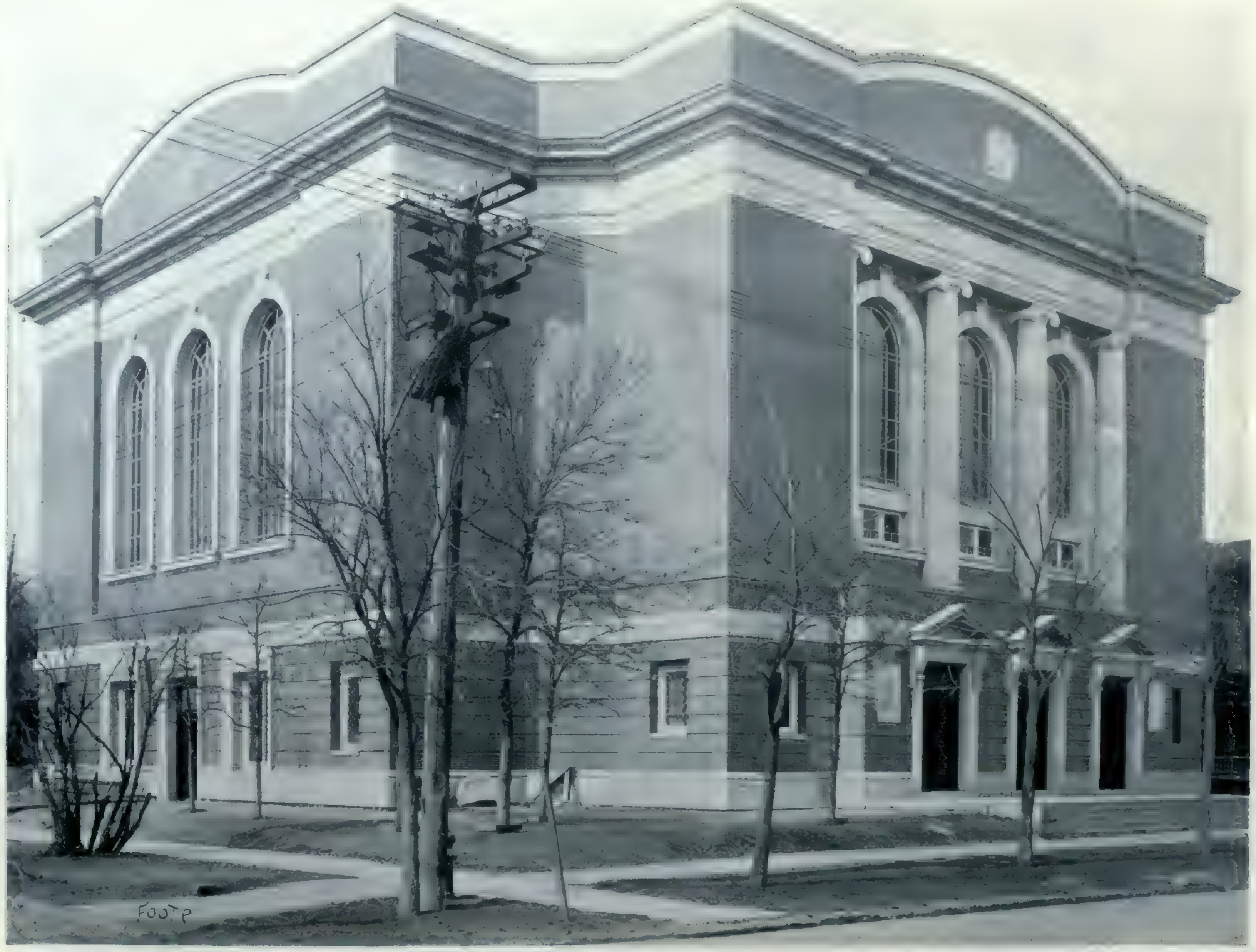
CEILING PLAN.



UPPER FLOOR PLAN.

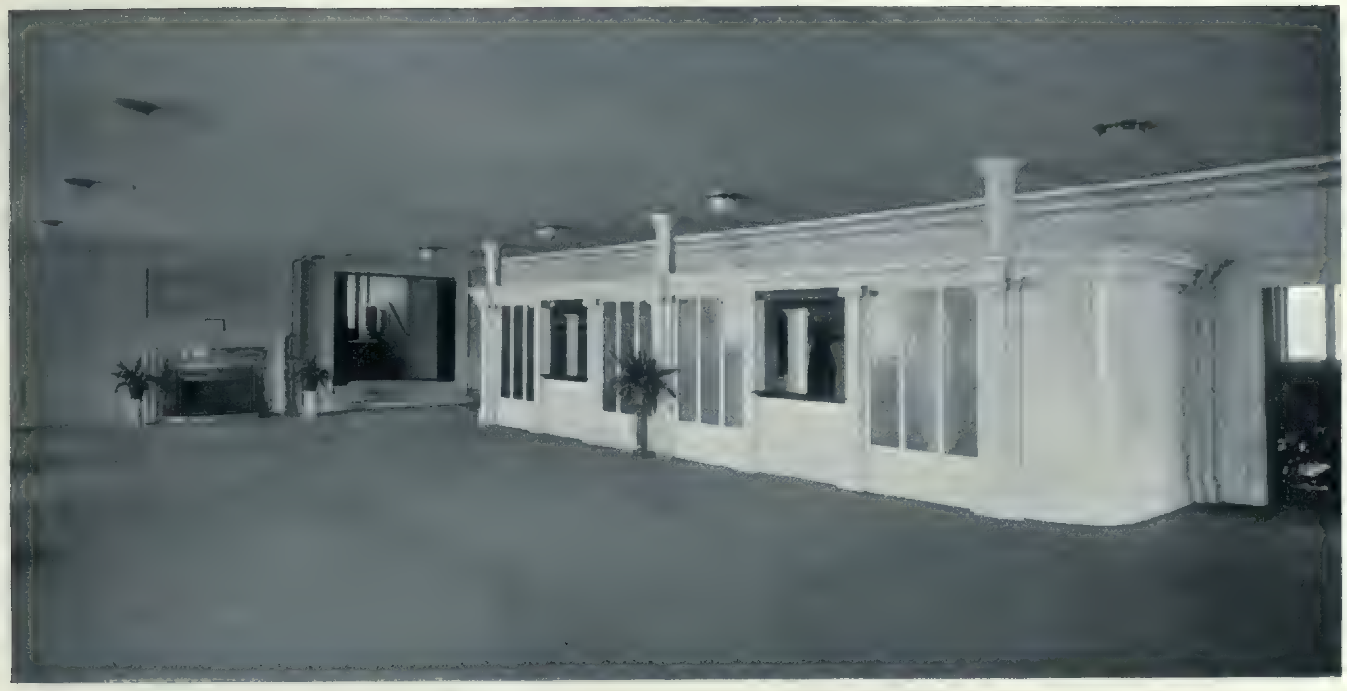


GROUND FLOOR PLAN.



FIRST CHURCH OF CHRIST SCIENTIST, WINNIPEG.

JORDON & OVER, ARCHITECTS.



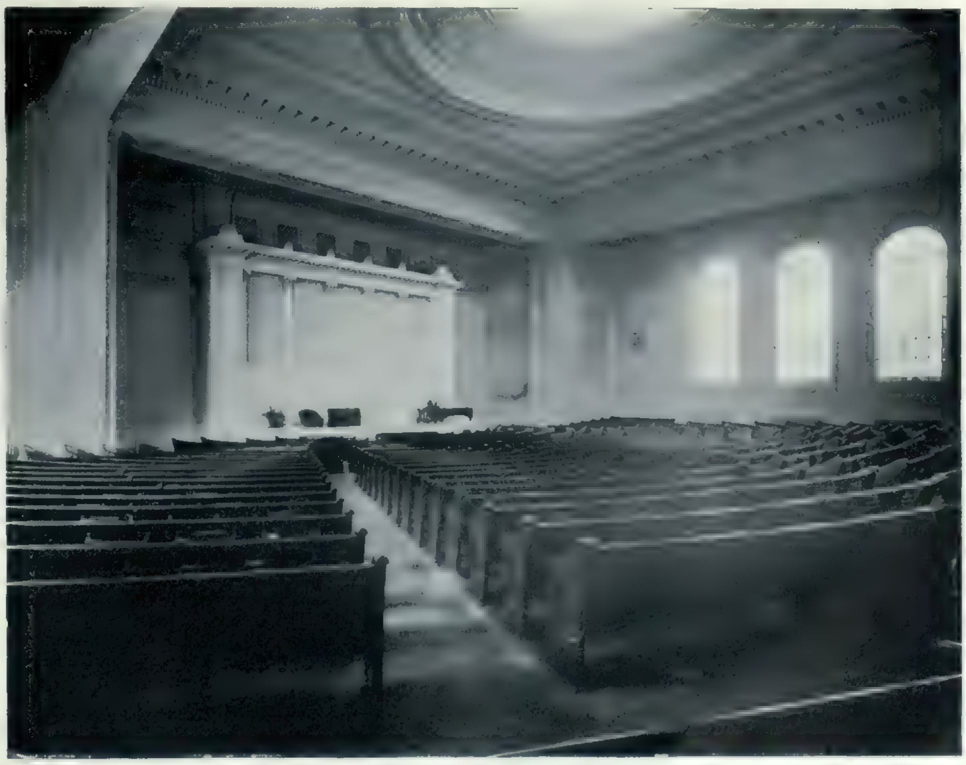
FOYER, FIRST CHURCH OF CHRIST SCIENTIST, WINNIPEG. JORDON & OVER, ARCHITECTS.

FIRST CHURCH OF CHRIST SCIENTIST, WINNIPEG

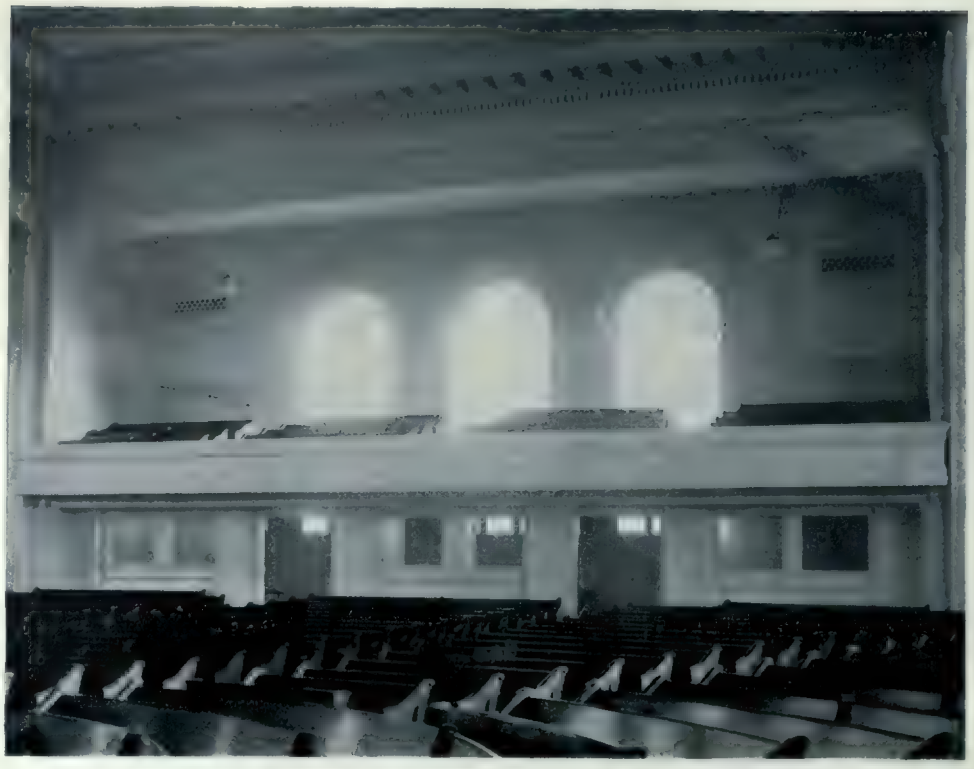
JORDON & OVER, Architects

In plan this building forms a Greek cross, the extreme dimensions of which are ninety feet. The main entrance hall is twelve by sixty feet, extending transversely, with stairs at either end leading to the auditorium above. Direct access is given to a spacious foyer, forty by sixty feet, which, together with the large Sunday school room, fifty by sixty feet, takes up practically the entire ground floor. Seating accommodation is provided in the Sunday school room for three hundred pupils. The foyer has also a separate carriage entrance and a large cloak room with racks for four hundred hangings. Additional access to the auditorium is obtained by stairs leading from the corridor in the rear, and along which are situated retiring rooms for men and women, together with a general committee room. There is also a private staircase communicating with the readers' room above, in addition to stairs leading to the boiler room in the basement, and emergency exits opening onto a covered porch at the rear.

In the auditorium on the upper floor the seating area takes up a space of approximately sixty by ninety feet. In addition to this there is a gallery fifteen by sixty feet, situated over the main entrance, and which increases the seating capacity to a total of about eleven hundred. Immediately behind the readers' platform there are four private rooms for use of the readers, organist and soloist. Entrance from these rooms is gained by doors at the rear of the platform which form part of the panelling. The organ loft, which is immediately above, is twelve by thirty-four feet, the front being enclosed by a colonnade with open grille panelling between the columns concealing the organ from view.



AUDITORIUM, FIRST CHURCH OF CHRIST SCIENTIST, WINNIPEG.



VIEW TOWARDS GALLERY, FIRST CHURCH OF CHRIST SCIENTIST, WINNIPEG.

The exterior walls above the grade are faced with light buff pressed brick of Roman shape, with Tyndall stone trimming. The interior division walls are also of brick, and the partitions are of wood studding covered with metal lath and plaster. Furring and plaster board are used on all outside walls as a base for the plasterer. The interior trim throughout is of birch finished in ivory enamel, with the exception of the doors, which are of mahogany. The walls and ceiling are decorated with light, warm tones, with panels brought out by relief bands of darker harmonizing colors. The pews have mahogany finish and rolls, with birch backs and seats finished to match.

The heating is by a low pressure steam gravity system, with direct radiation. The building is ventilated by means of an electrically driven blower, which draws air in from outside and delivers it to all parts of the building through a system of metal ducts. The air can either be drawn into the building direct, or conducted through a special furnace for the purpose of moderately warming it before being delivered to the various rooms. This system is arranged so that it can be used to supply fresh air, or recirculate the air already in the building and heat the building in moderately cold weather.

The auditorium is electrically lighted by means of nine five hundred watt nitrogen lamps in single unit fixtures distributed on three sides of the room near the outside walls, three over the gallery and three at each of the two sides, adjacent to the gallery.

The cost of the building was approximately one hundred thousand dollars.

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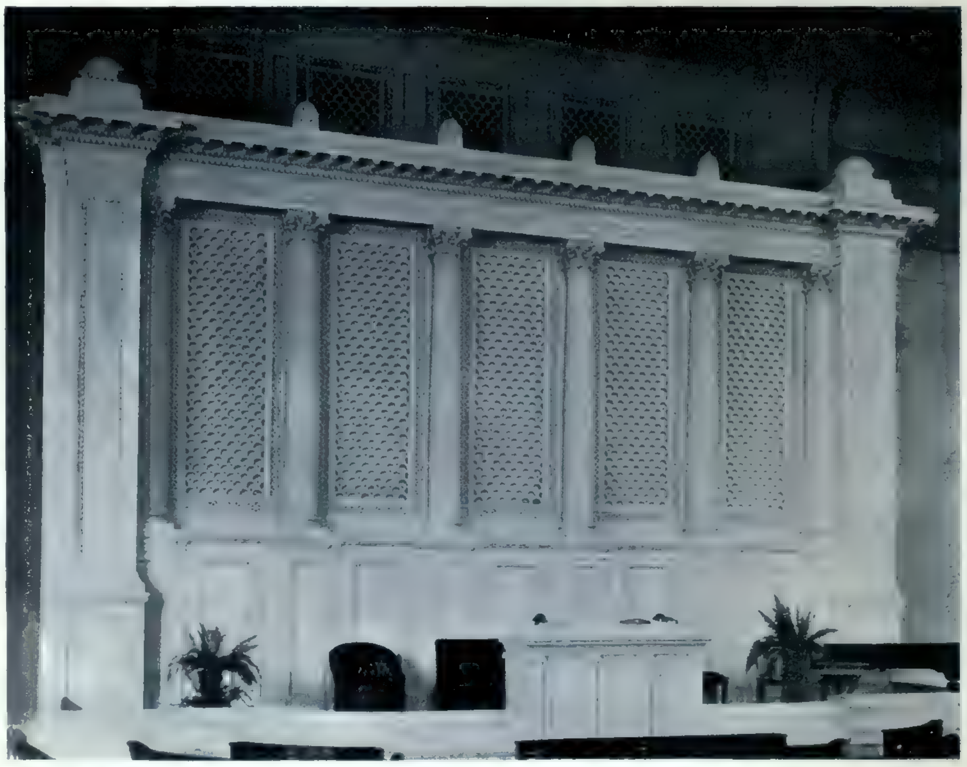
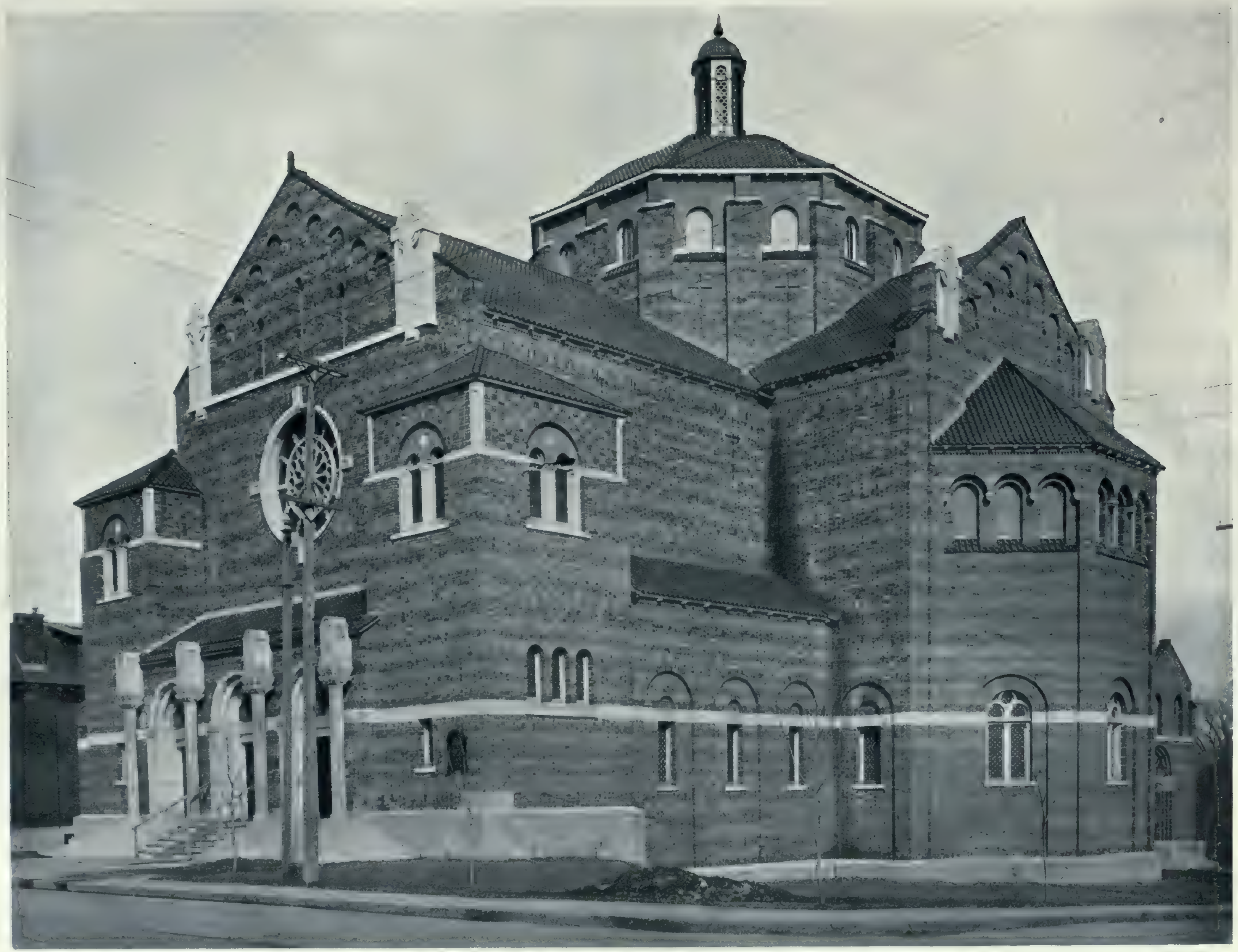
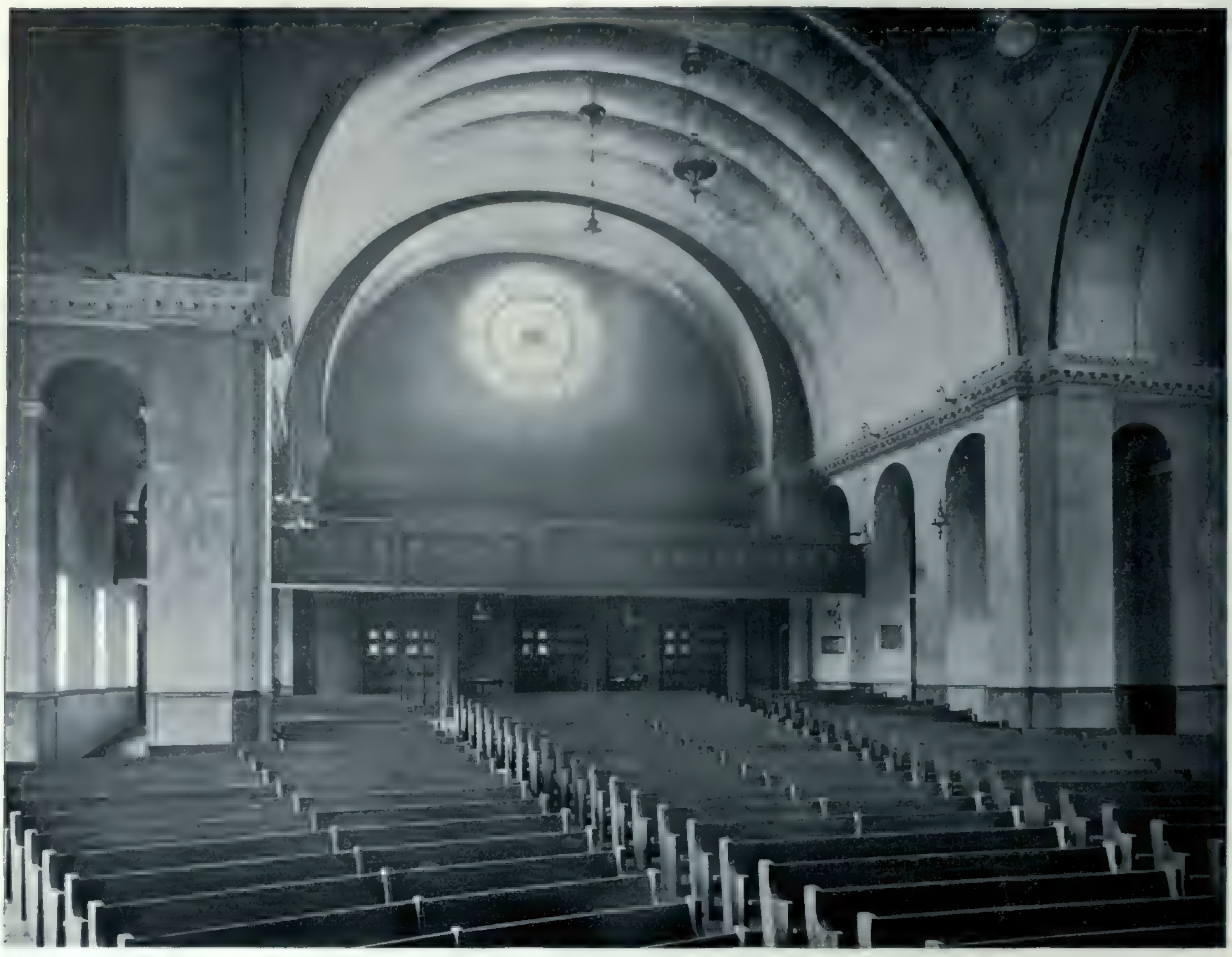
The spiritual welfare of the community forms a distinct part of the housing scheme of the Government of New South Wales, which has set aside three hundred and thirty-seven acres of Crown land in the suburbs of Sydney for the erection of workingmen's cottages. Reservations have been made for roads, parks, and religious purposes, also for police stations, administrative buildings, etc. Two hundred and eleven acres are reserved for building sites, on which cottages are being erected, seven to the acre. This will provide a total of 1,437 cottages and forty shops. Already two hundred and forty cottages and six shops have been completed.



READERS' PLATFORM AND ORGAN SCREEN, FIRST CHURCH OF CHRIST SCIENTIST, WINNIPEG.



STANLEY PRESBYTERIAN CHURCH, MONTREAL. HUTCHISON, WOOD & MILLER, ARCHITECTS.



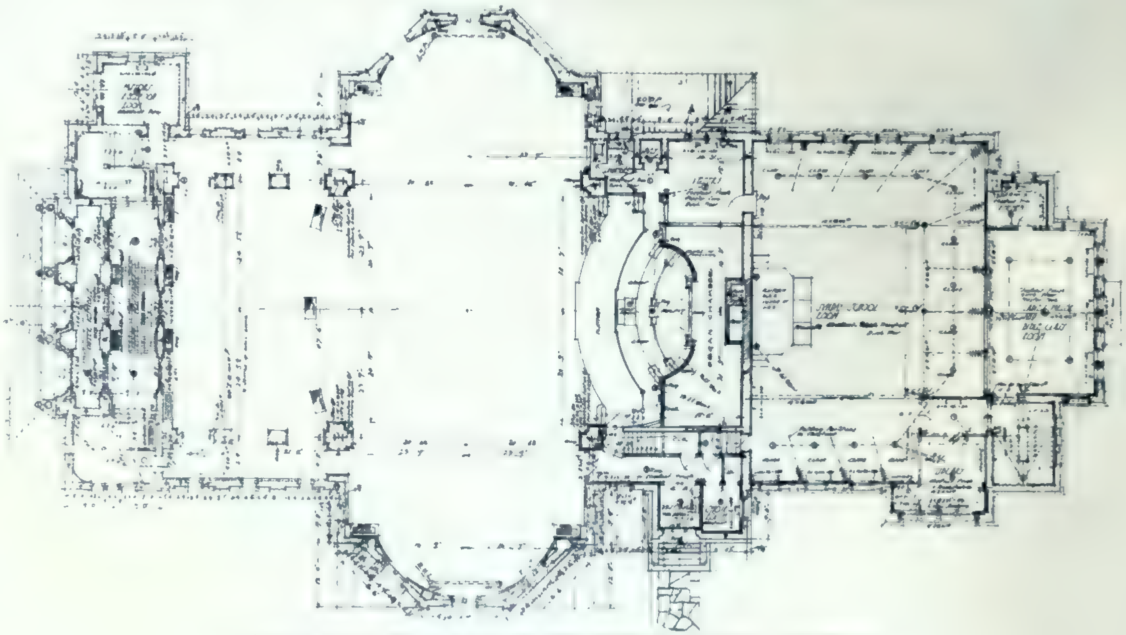
VIEW TOWARDS ENTRANCE, STANLEY PRESBYTERIAN CHURCH, MONTREAL. HUTCHISON, WOOD & MILLER, ARCHITECTS.

THE STANLEY PRESBYTERIAN CHURCH, MONTREAL

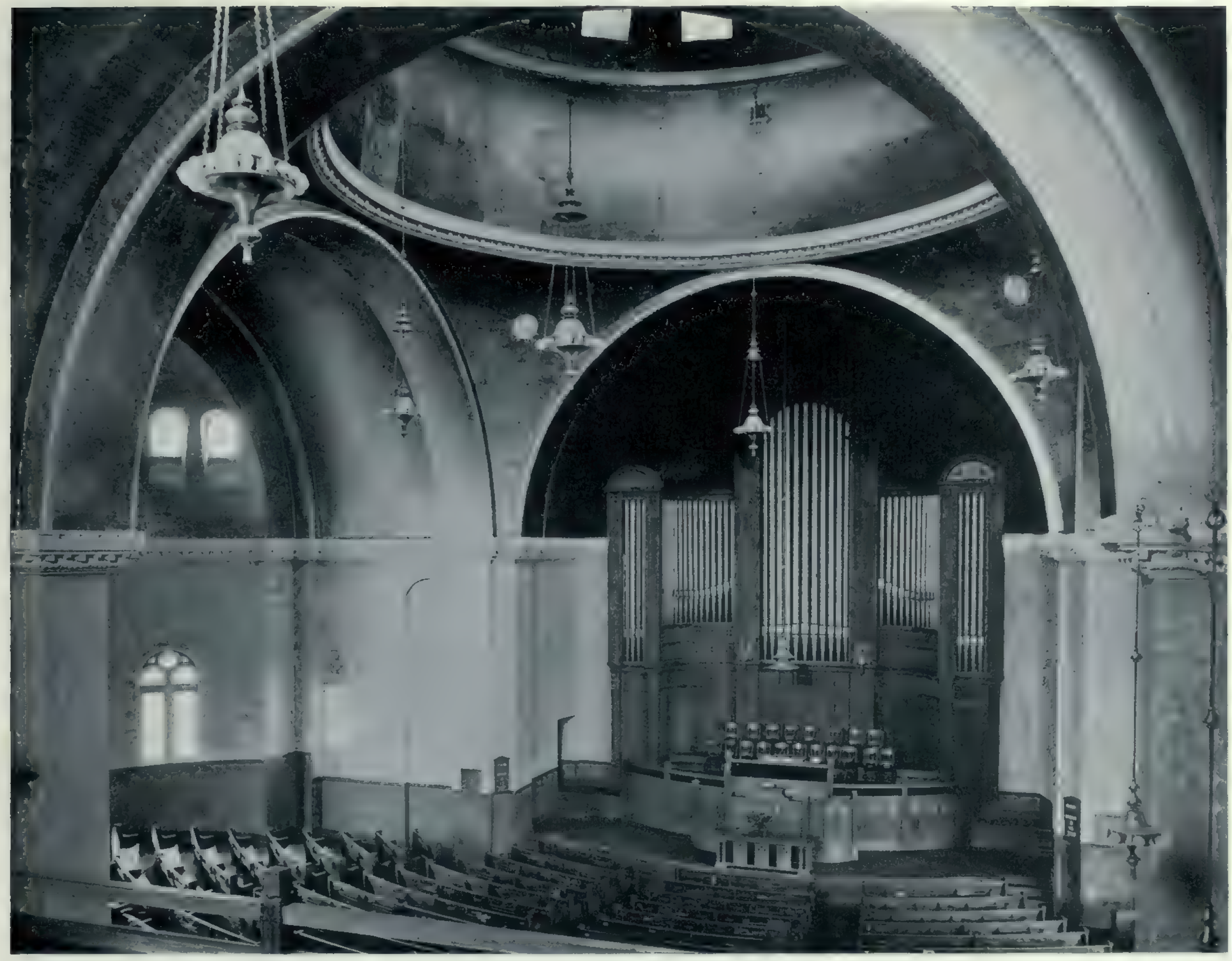
HUTCHISON, WOOD & MILLER, Architects

No type of ecclestical work is better adapted to show the effective use of brick than that designed in the Lombard style characteristic of the twelfth century in northern Italy; and an especially interesting modern example is the Stanley Presbyterian church on Westmount avenue, Montreal. Two tones of Scotch fire bricks are used, set up in uneven courses of from four to six courses for each band, and harmoniously blended so as to produce an attractive and artistic exterior. The trimmings are of Bath stone and the roof of deep red tile.

The plan is cruciform, with a slight variation from the usual in that the transepts are finished octagonal on the outside, but showing a circular wall on the inside; the dome being the full size of the crossing of nave and transepts.

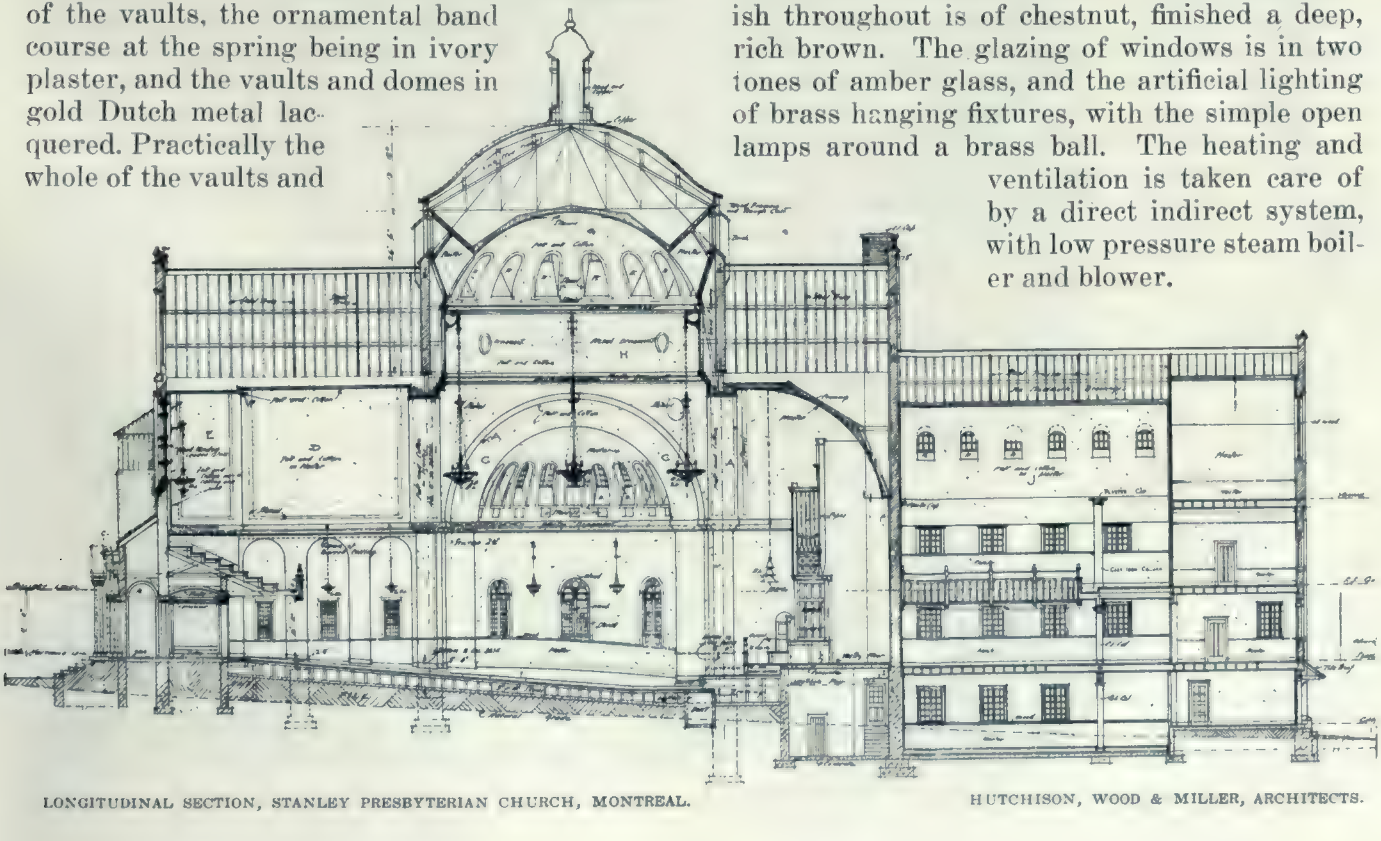


GROUND FLOOR PLAN, STANLEY PRESBYTERIAN CHURCH, MONTREAL.



LOOKING TOWARDS CHANCEL, STANLEY PRESBYTERIAN CHURCH, MONTREAL.

The interior finish is very simple in treatment, the walls being in sand-finished plaster, treated in a soft French grey up to the spring of the vaults, the ornamental band course at the spring being in ivory plaster, and the vaults and domes in gold Dutch metal lacquered. Practically the whole of the vaults and domes are in cotton applied over heavy hair felt, this giving practically perfect acoustical properties to the auditorium. All the wood finish throughout is of chestnut, finished a deep, rich brown. The glazing of windows is in two tones of amber glass, and the artificial lighting of brass hanging fixtures, with the simple open lamps around a brass ball. The heating and ventilation is taken care of by a direct indirect system, with low pressure steam boiler and blower.



LONGITUDINAL SECTION, STANLEY PRESBYTERIAN CHURCH, MONTREAL.

HUTCHISON, WOOD & MILLER, ARCHITECTS.

The building has, at present, a small gallery at rear, capable of seating about one hundred, with provision made for future galleries in the transepts; the seating facilities in the auditorium accommodating between eight and nine hundred.

The total cost of the church in itself (the Sunday school not having been built as yet) was in the neighborhood of $114,500.

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FIRST PRESBYTERIAN CHURCH, MONTREAL

HUTCHISON, WOOD & MILLER, Architects

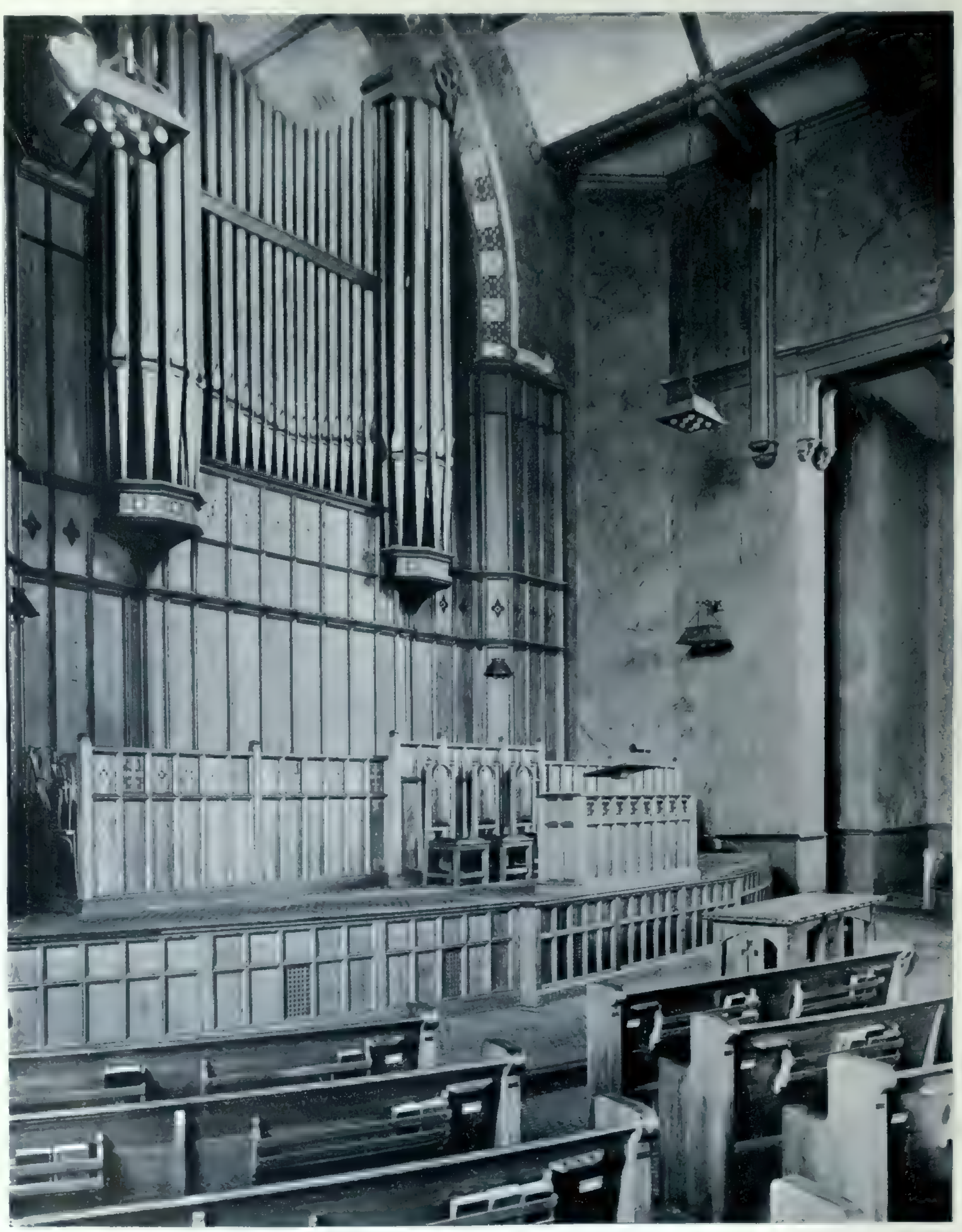
An exterior view of this edifice was shown in this magazine on a previous occasion, and the object of the illustrations presented herewith is for the purpose of showing the interior treatment, which, owing to the lack of photographs was impossible at that time.

The arrangement is carried out so as to give an unobstructed view, from any sitting in the church, of the platform and organ; the general lines and decorative scheme producing a dignified and restful effect. The walls are of a sand-finish plaster, tinted in deep green, which harmonizes with the dark brown given the chestnut pews and woodwork used throughout. The ceiling plaster is grey, and the glass is simple amber quarries. The artificial lighting comes from ten fixtures suspended from brackets, each one containing eight candle lights. In addition there are side brackets of similar design.

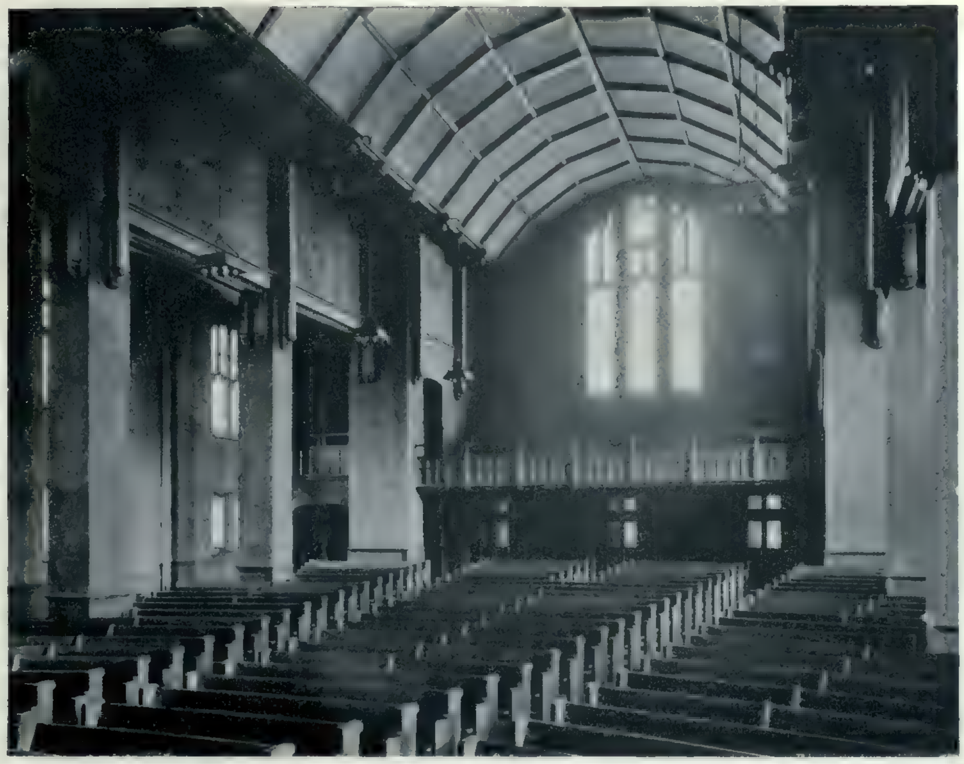
Seating accommodation is provided for eight hundred and fifty on the ground floor, and for one hundred and fifty in the gallery over the vestibule. The plans also allow for possible future side galleries in the transepts, which will give accommodation for an additional two hundred.

At the rear of the building are the Sunday school quarters, consisting of an auditorium with galleries on three sides, accommodating about six hundred. This is lighted partly from the side and partly from a skylight over the auditorium. Adjoining is the church parlor and other similar offices.

The heating of the church proper is by forced air, over pin radiators, placed immediately under each outlet duct. The air, driven through the pipe duct by motor-driven fan, is perfectly tempered by the heat from steam pipes, which also run in this duct, and finally heated when



PLATFORM AND ORGAN, FIRST PRESBYTERIAN CHURCH, MONTREAL. HUTCHISON, WOOD & MILLER, ARCHITECTS.



VIEW TOWARDS ENTRANCE, FIRST PRESBYTERIAN CHURCH, MONTREAL.

passing through the pin radiators. During warm weather the fan can be used for introducing fresh, cool air into the building. The air in the auditorium, if comparatively fresh, can be used by recirculation system back to the fan, or can be expelled through a vent shaft, and perfectly fresh air introduced into the auditorium. The steam heating is supplied by a cast-iron steam boiler, while that of the Sunday school is altogether by hot water.

The exterior of the building is faced with mixed blue and green sandstone, cut rock face, and trimmed with the same material tooled. The roofing is of slate.

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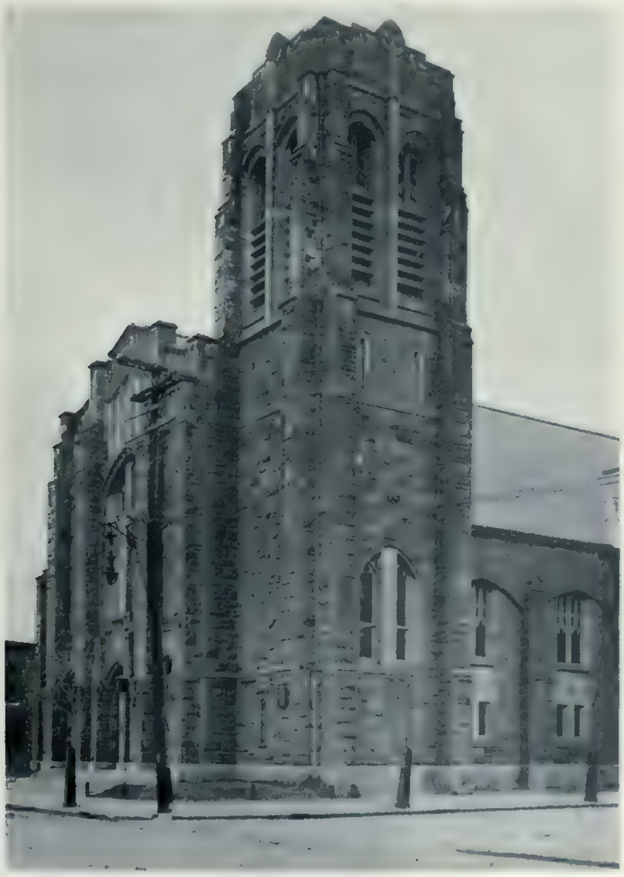
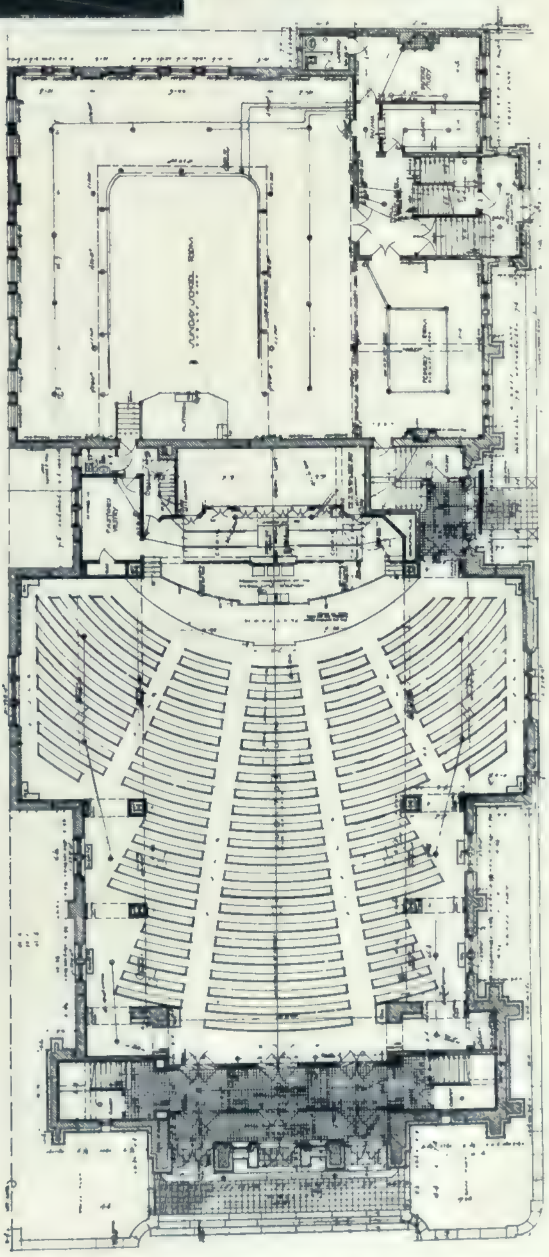
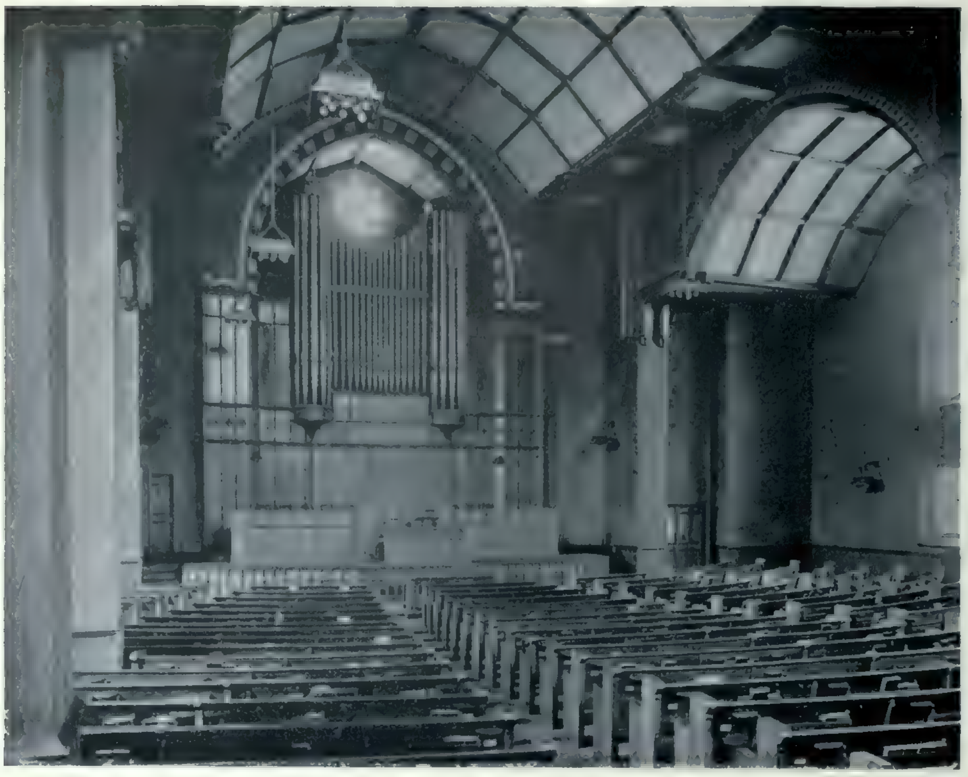
One should perhaps consider recent ecclesiastical work not so much in comparison with old world edifices so generally the criterion of the student; but rather from the viewpoint as to what has grown out of the immediate past, and as to what the present tendency indicates as to the future.



DETAIL OF TOWER, FIRST PRESBYTERIAN CHURCH, MONTREAL.



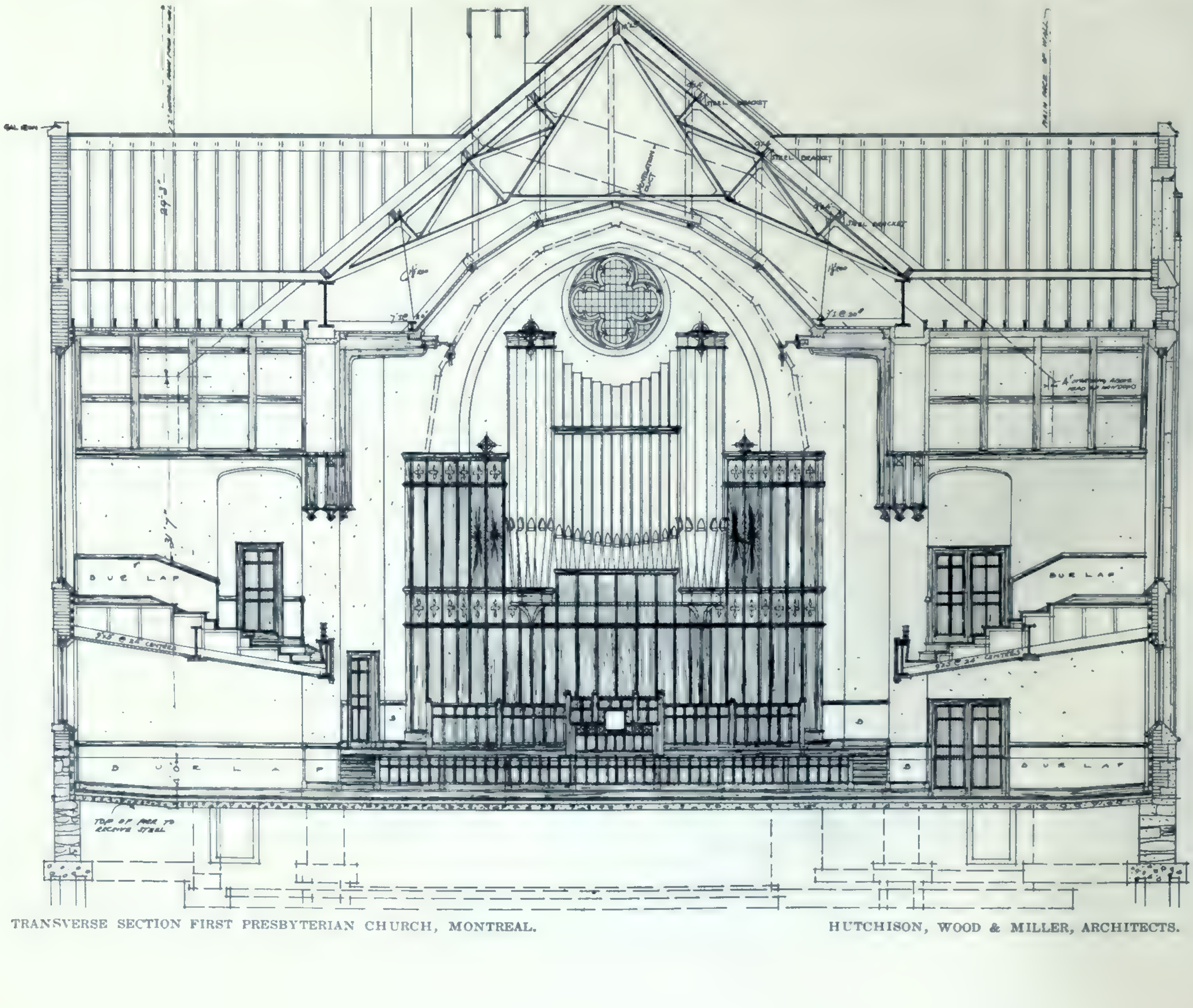
GROUND FLOOR PLAN, FIRST PRESBYTERIAN CHURCH, MONTREAL.



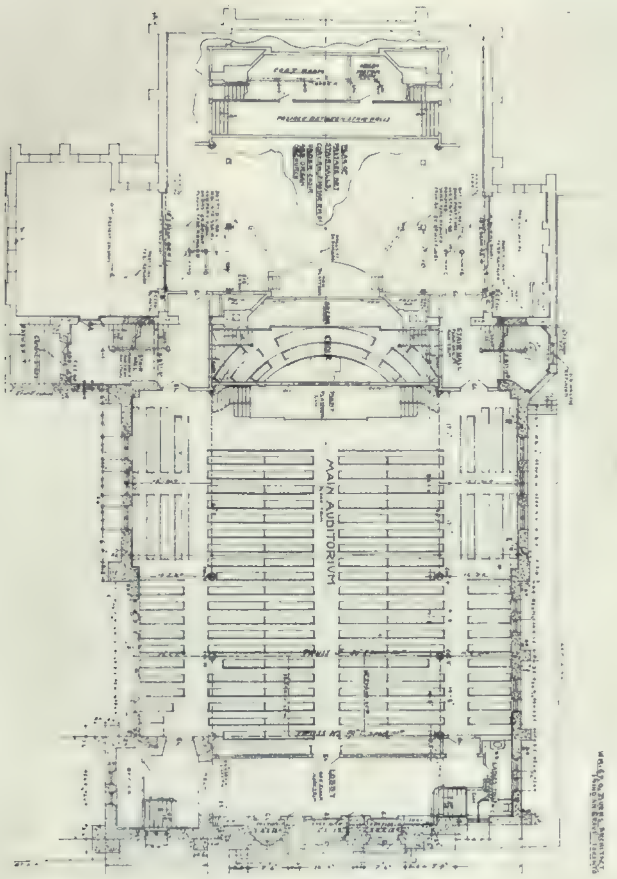
GENERAL VIEW OF AUDITORIUM, FIRST PRESBYTERIAN CHURCH, MONTREAL.

Of course, it is not to be understood that this is intended to minimize the value of notable examples which will always remain a source of inspiration and traditional guidance to church designers; but it is more the spirit of the masters which brought these beautiful forms into existence, rather than the forms themselves, which should most forcibly impress us. Form in itself too often leads to assimilative architecture, while sincerity of purpose results in understanding and creative power.

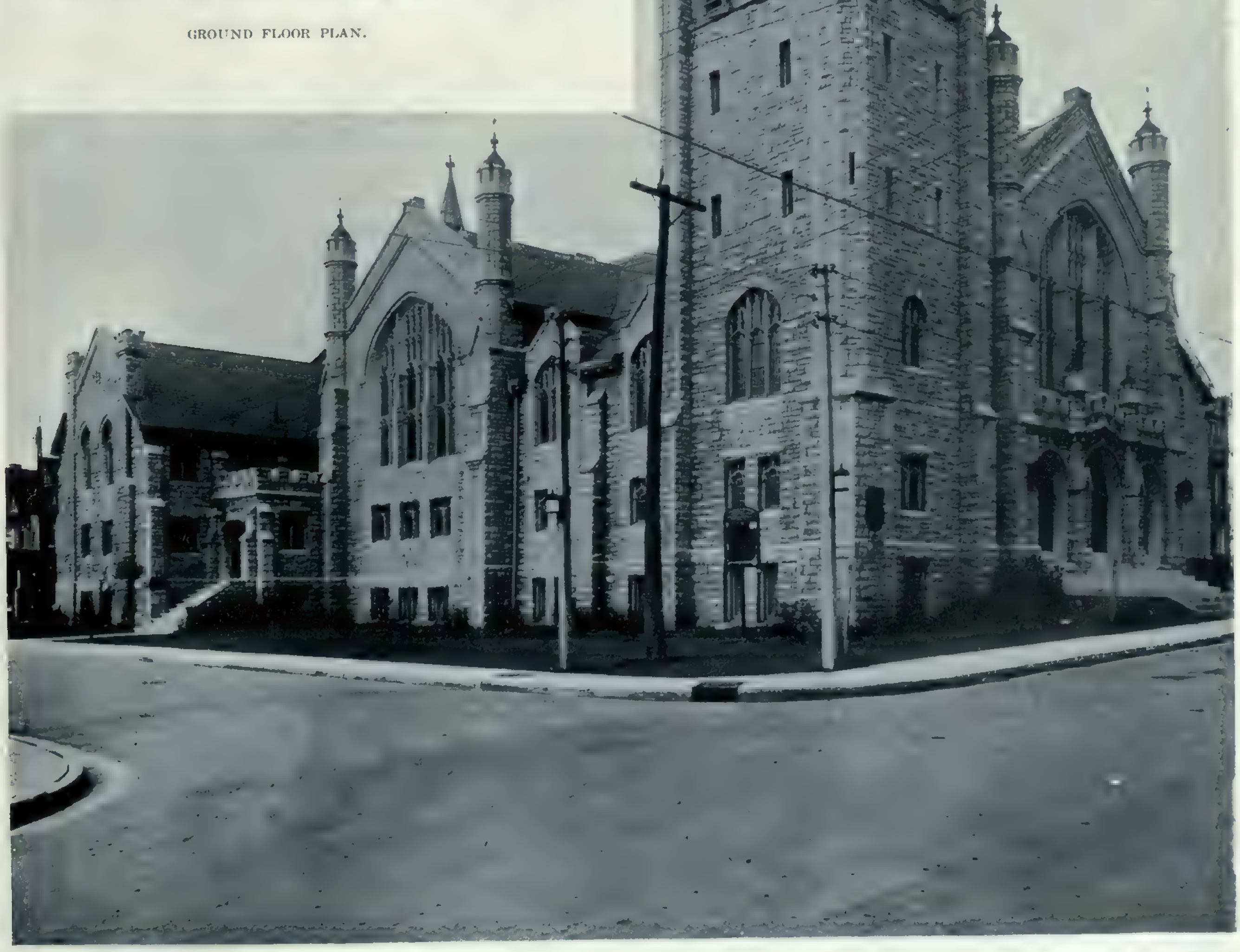
Assuming the basis of examining the present accomplishments against our previous efforts, there is at least substantial ground for encouragement and an outlook which is most hopeful and promising. One observes in the newer churches less chicanery, less deception, and a more sincere adherence to those ideals which are desired in all classes of buildings, and in church edifices especially, in which honesty in the use of materials and architectural expression is the underlying principle.



TRANSVERSE SECTION FIRST PRESBYTERIAN CHURCH, MONTREAL. HUTCHISON, WOOD & MILLER, ARCHITECTS.

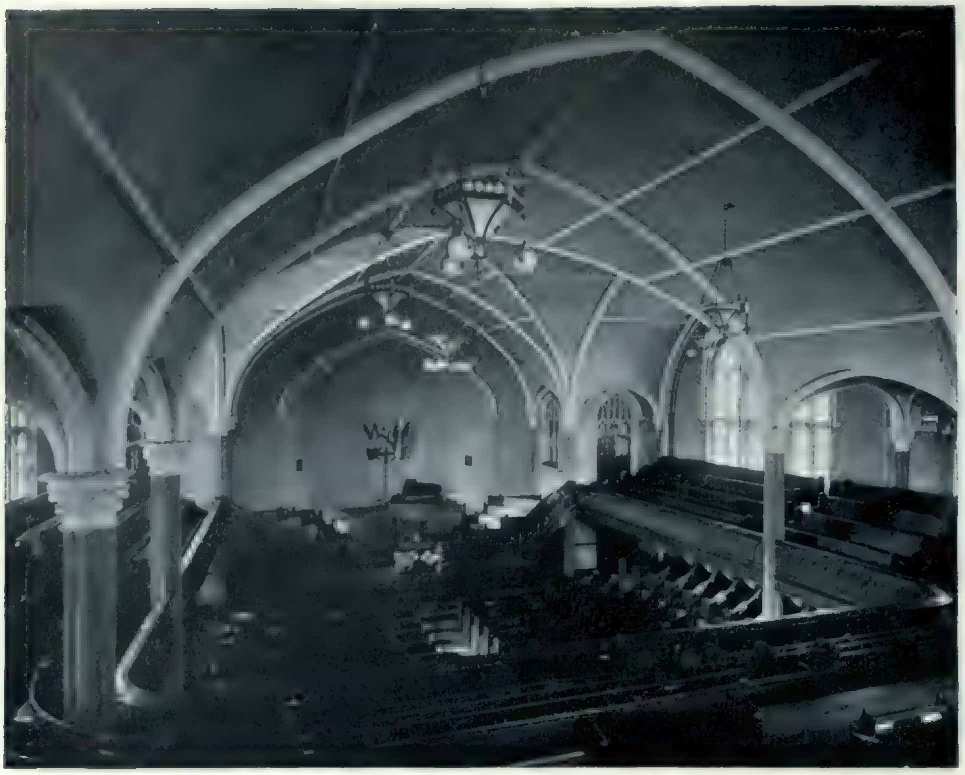


GROUND FLOOR PLAN.



HOWARD PARK METHODIST CHURCH, TORONTO.

WM. GEORGE BURNS, ARCHITECT.



AUDITORIUM, HOWARD PARK METHODIST CHURCH, TORONTO.

HOWARD PARK METHODIST CHURCH, TORONTO

WM. GEORGE BURNS, Architect

One of the comparatively recent edifices erected in Toronto is the Howard Park Methodist Church, on the northwest corner of Sunnyside avenue and Marmaduke street, designed in Perpendicular Gothic style. This structure is built of St. Mary's limestone, and has a seating capacity of a little over twelve hundred in the church proper, and about seven hundred in the Sunday school section.

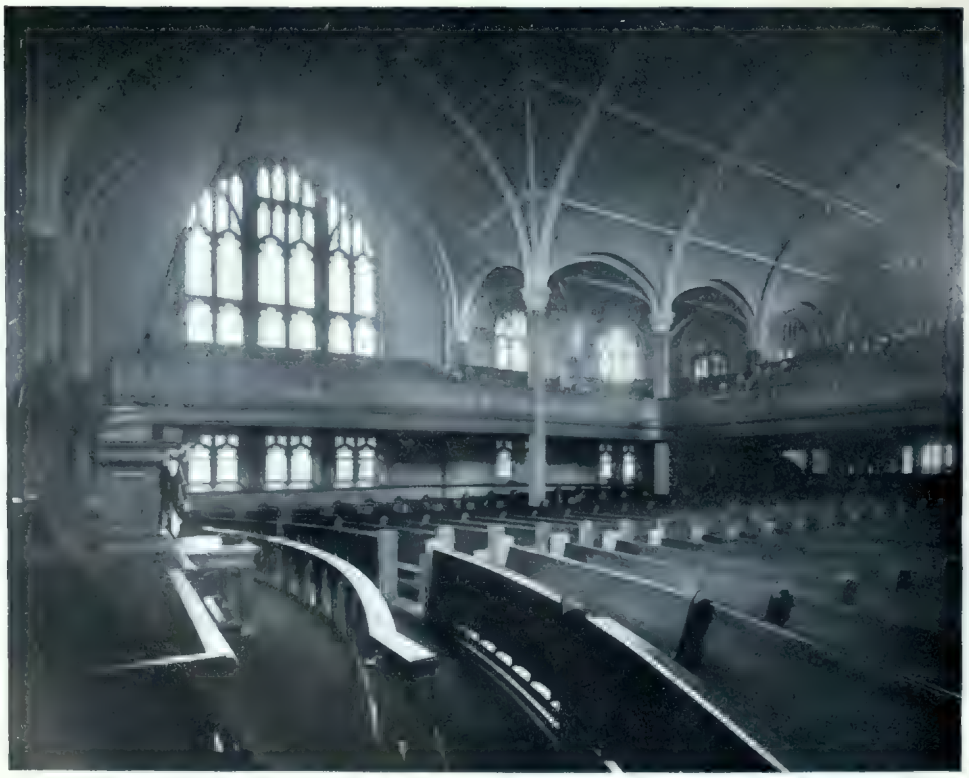
The tower and the large tracery windows in transepts are perhaps the most outstanding features of the design, the tower rising to a height of ninety feet, and lending dignity to the whole structure.

In plan the auditorium follows the usual cruciform arrangement, with large cement columns supporting the vaulted ceiling. The trim throughout is quartered cut oak, the pulpit, furniture, choir front and pews all being specially designed as part of the interior scheme.

The entrance to the auditorium is through a large lobby or foyer, tiled in Welsh quarries, and with a staircase at each end leading to the gallery above. An interesting feature is the partition separating the foyer from the auditorium. Instead of a solid wall or partition, as is usually the case, the upper portion of the partition consists of a number of heavy bevelled glass plates, which enable one to see into the auditorium before entering.

The Sunday school section is finished in ash, and is divided into class rooms on both the ground and first floors by a series of sliding doors or partitions. The extension to the south of the Sunday school is used in the basement for kitchen and cloak rooms; and the floors above for Bible class rooms and board room.

The basement of the Sunday school also provides a room which is used for social purposes and for the primary department. The gymnasium, about seventy feet square, is situated under the main body of the church, and has a clear floor space of forty-two by seventy feet between columns for basket ball and other games, with locker rooms and shower baths attached.

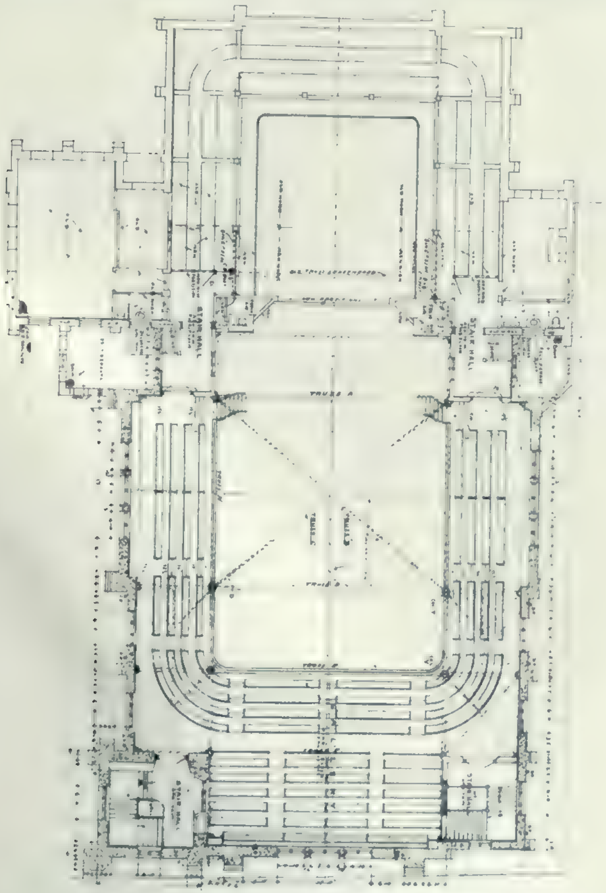


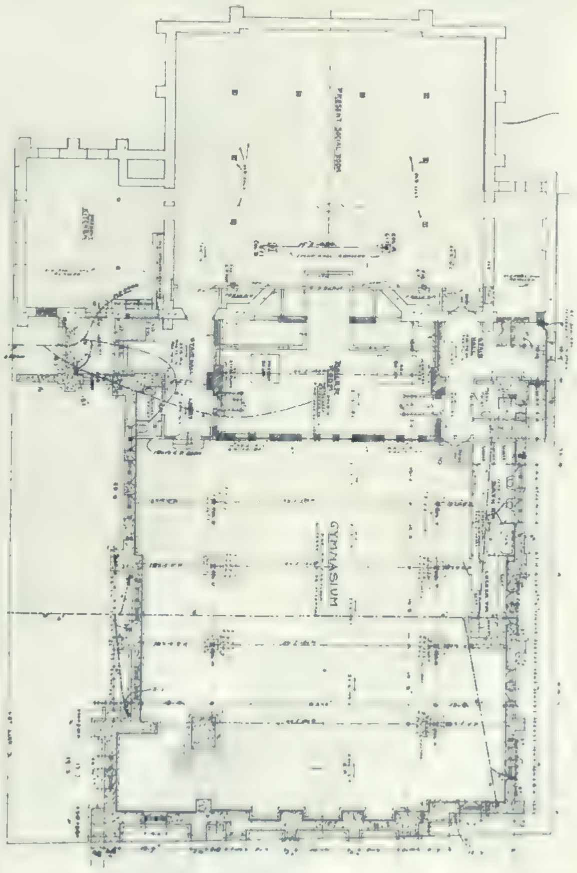
VIEW LOOKING TOWARDS SIDE GALLERY AND TRANSEPT, HOWARD PARK METHODIST CHURCH, TORONTO.

THE DOME IN ARCHITECTURE

The dome is one of the most interesting of all architectural forms, and is more expressive of magnificence and grandeur than any other of the structural features of architectural expression. While the vault conveys the impression of mystery and sublimity, often aided by partial darkness, the dome gives an impression of serenity and light. The arch and lintel grew out of practical necessities, and are used in the humblest structures erected by mankind, though they have their place in more ambitious structures, but the dome is pre-eminently the expression of the "Grand Manner" in architecture, and fails in effect if used on too small a scale, except as an occasional internal decorative feature. The history of its development is that of a feature which was first conceived for internal purposes, but which in the progress of time has become more and more often used as a means of obtaining external architectural effects. The Romans and the Byzantines used it as a constructional feature of internal architecture, but it became in the hands of the Renaissance architects the culminating means of external display. In the Pantheon it is only internally that the dome is clearly expressed, at Hagia Sophia the same holds true, and in Byzantine churches its form is more

FOYER, HOWARD PARK METHODIST CHURCH, TORONTO.


GALLERY, HOWARD PARK METHODIST CHURCH, TORONTO.



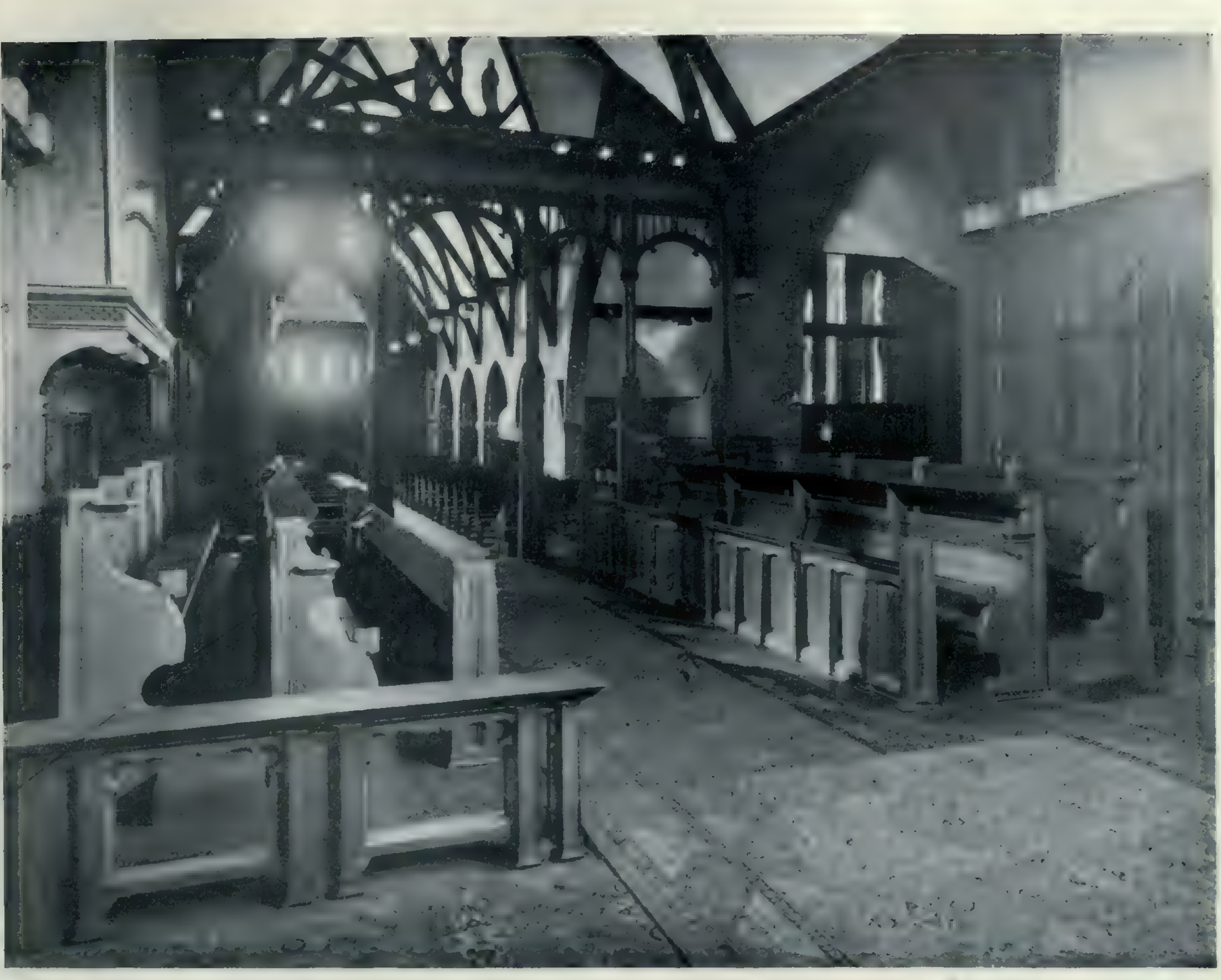
BASEMENT PLAN, HOWARD PARK METHODIST CHURCH, TORONTO.

REMODELLED INTERIOR OF ST. THOMAS' ANGLICAN CHURCH, TORONTO. EDEN SMITH & SONS, ARCHITECTS.

often than not entirely concealed beneath a tiled roof of flat pitch. In St. Mark's, at Venice, the same is true, for the domes which show externally are a later timber and lead erection, in no way conforming to the internal lines of the structure beneath.

Compared with such buildings, the use of the dome in many later Oriental buildings, and in almost all Renaissance ones, seems almost entirely dictated by the desire to employ an effective external feature which might in many cases be obliterated with actual advantage to internal effect. It is strange that many who have belittled Roman architecture have failed to perceive in it the frankest recognition of the wants and habits of mankind which the world has ever seen. Criticism has been so exclusively concentrated on the meaning of detail—often arrived at by unjustifiable assumption—that it has missed the cardinal fact that the Roman builders, even in their most magnificent constructions, were less concerned with outward show than with considerations of internal convenience. There is nothing in Roman architecture which can be held to be so purely decorative as the turrets, towers and spires of many of our mediæval buildings, or the manner in which steeply pitched roofs were often used when flatter ones would have afforded a readier way of covering space. Certainly both Roman and Byzantine builders were content to use the dome for purely practical internal objects, leaving their outward form uninfluenced; and compared with such examples the Renaissance dome so often used in connection with churches, becomes a mere external lantern which interrupts, when placed centrally, a range of vaulting. For strictly ecclesiastical purposes it may be held that the dome is a mistake when used in the centre of a Latin cross, as it breaks up a vista and dissipates interest, which should be concentrated in the culminating point of design, the east end. The usual form of the Renaissance dome surmounted by a lantern is also a bad form constructionally, since it throws weight on the weakest point of the whole structure, a fact which in St. Paul's has necessitated much ingenious construction, and in addition supplied arguments to those who maintain that in all good architecture the structural means should be apparently displayed. And it must be admitted that the dome of St. Paul's is only by a degree separated from the emphasis given to the crossing in a Gothic plan.

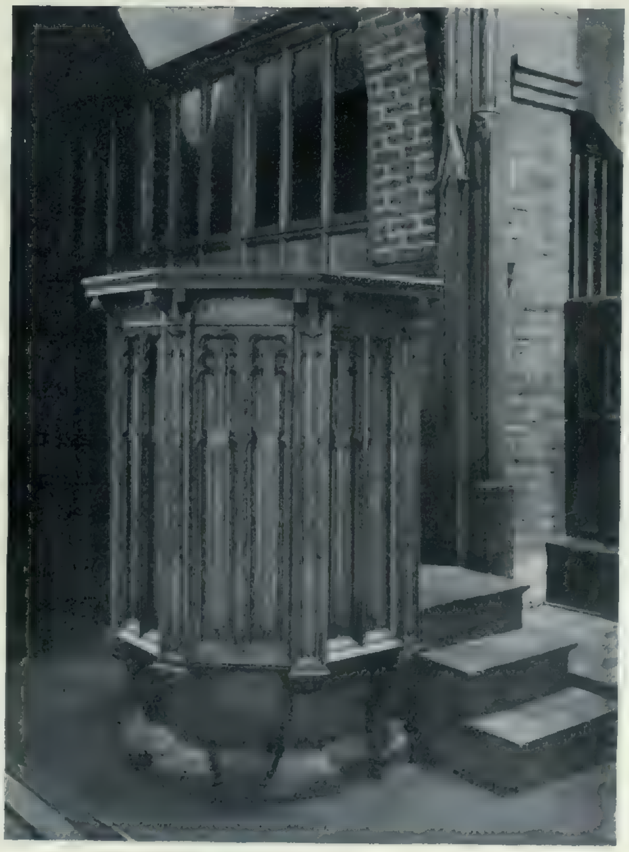
The dome as used by the Renaissance architecture is a feature which replaces the tower,



REMODELLED INTERIOR OF ST. THOMAS' ANGLICAN CHURCH, TORONTO. EDEN SMITH & SONS, ARCHITECTS.

and, as in the case of the tower, an internal effect is seldom obtained; for the great height and limited positions from which a dome employed in this way can be readily seen, largely do away with its value, and the effort to reconcile diametrically opposite functions finds its expression in a most interesting series of examples in which the external covering is carried out by ingenious and complicated hidden construction. In the case of the vault the difficulty of appreciating enormous heights is done away with because we can usually obtain one long vista, but the difficulty is apparent in some comparatively short and enormously lofty churches on the continent. In Wren's rejected design for St. Paul's he succeeded more nearly than any of the architects of the Renaissance in producing a design giving effect to the internal expression of the dome, but even here the domical idea is less clearly expressed and emphasized than we find it in Byzantine architecture, entirely dominated as it is by the desire to obtain the fullest value out of a feature which affords unusual possibilities of effect.

We are far from wishing to see the dome used in the earlier constructive sense alone; but it is to be regretted that it is not more often used as an inner covering of great space.—*The Builder.*



DETAIL OF PULPIT, ST. THOMAS' ANGLICAN CHURCH, TORONTO.

Co-Operation in Design

By A. R. JEMMETT

Paper read before Royal Institute of British Architects.

THE principle of intelligent co-operation between those concerned in actual building operations — between the architect and the decorator, the architect and the craftsman—is now fully recognized; but the way in which this principle should be put into practice appears to be a question on which there is more to be said. I hope it will be said by those better qualified than I am to say it.

This is one aspect of co-operation, and a very important one; but that to which I would draw attention is the need for closer and fuller cooperation between architects themselves during the conception and development of their designs before building co-operation has a chance to begin. More particularly would I point to the immense value of a real spirit of co-operation and mutual assistance; to its widening effect on the mental outlook, its stimulating effect on the imagination, and its general tendency towards raising the standard of architecture and the repute of those who practise it. I submit that the possibilities of this form of co-operation have not been sufficiently explored. This may be partly due to racial characteristics, and partly to the fact that we are just emerging from a period of unrestricted individualism in design, and may be still susceptible to its influence. During this period genius dwelt apart, and wrought in splendid isolation, jealously guarding its trade secrets, as deeds of apprenticeship testify. Each designer was a law unto himself. Everyone went his own way simply because it was his own way, indifferent, apparently, to his destination, and priding himself on the fact that, whatever else his work might or might not be, at least it was his own. "A poor ill-favored thing, sir, but mine own." The mere fact that it was entirely "mine own" down to the last cupboard-door handle or casement fastener was evidently considered ample excuse, or even justification, for its poverty and ill-favor. Each man for himself and the devil take the hindmost adopted as a rule of artistic conduct created an atmosphere of mutual jealousy and veiled hostility in which it was actually possible to refuse to publish one's drawings for fear that others might learn something from them. So was knowledge spread and architecture advanced.

The perverted morality of this golden rule need not detain us. Obviously the devil would take the foremost, not the hindmost, by any ethical standard conceivable now. What concerns us, however, is the lack of intelligence that failed to perceive that we are all members of the same body, and cannot flourish individually unless the whole body flourishes collectively, and that if we fail to support the body we ourselves must ultimately perish. It concerns us because we are faced with the result, the inevitable reaction of the lowered vitality of the ill-nourished body upon the health of its individual members.

Granted that we now breathe a more congenial atmosphere, and that a more enlightened self-interest has taught us that we can best serve our own interests by serving those of the body to which we belong, that the more we give the more we receive; but are we yet fully persuaded that isolation is mental and spiritual starvation, and that the quality of a design is of more importance than its authorship?

To those who still hold the opinion that each man's design is, and must be, entirely his own this question of co-operation may present some difficulty. The mere idea of a collective concept, or of co-operating to produce a concept, may suggest a paradox or a contradiction in terms. I think it is March Phillipps who points out that architecture is the most intellectualized of all the arts. If, bearing this in mind, and accepting the view that it is also a communal product expressing certain aspects of communal life, we examine the nature of our work, the conditions under which it is carried out, and the mental processes involved, the difficulty may, perhaps, disappear. We may even arrive at the conclusion that no man's design ever is, or can be, entirely his own, or, to be more precise, that no architectural design ever is, or can be, the outcome of a single mind.

We have to remember that, although under the impulse to create we may all visualize castles in the air, yet that as a matter of fact such personal mental concepts rarely materialize. It may be possible to suddenly create, to visualize instantaneously, and straight away to go and build just the one building that can express the mood of the moment—it may be possible, but the point is, we don't do it. We do not get the chance. We may have the impulse and the vision, but not the opportunity. A procedure allowed to the poet or the musician is denied to the architect. He can only design the buildings that other people require, and when they require them. He finds his opportunity for self-expression limited by the fact that both the impulse to build, the nature of the building and the germ of the idea for its design originate with those who need the building, not with those who build it; as well as by the further fact that accommodation, site, cost, and so forth, are all predetermined and presented to him as factors in a problem he is called upon to solve. Regarding our work from this point of view—the solution of a given predetermined problem—we may be disposed to admit that co-operation in its solution is possible.

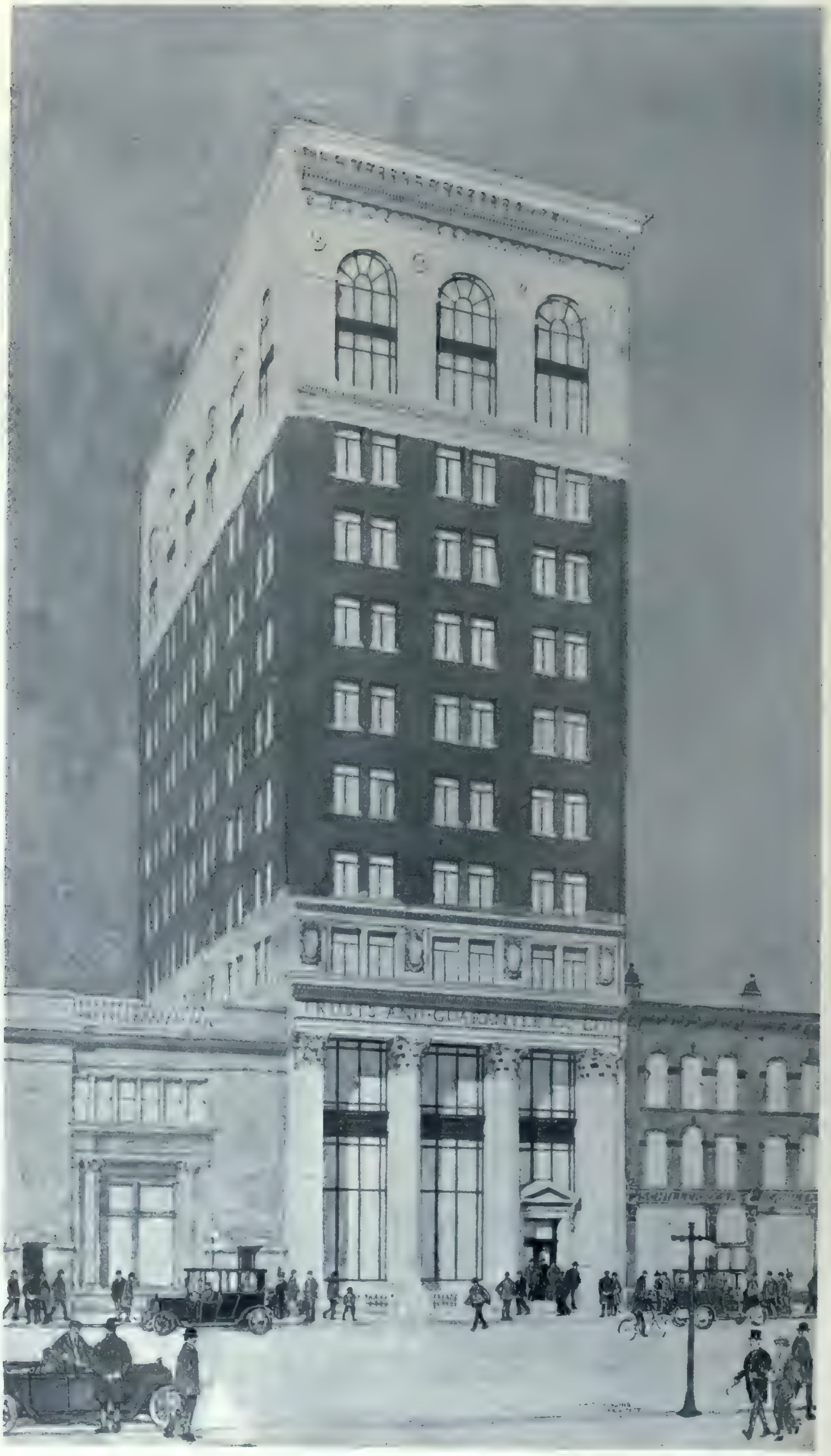
There may be buildings so small and so simple that the solution of any problem they present is obvious, but there are others so large and so complex that it can only be arrived at slowly by analysis leading to synthesis, a process of gradually building up or evolving a mental concept which must be not only complete in itself but the one that presents the right solution of the particular problem in hand. When we consider the nature and the amount of the preliminary analytic work required before we are in a position to proceed to a synthesis; the danger of a premature synthesis, under pressure of the time limit; the number of possible solutions that present themselves, and the amount of judgment required to choose between them, we may be prepared to admit that co-operation is not only possible but desirable. Indeed, when we further consider the rapid advance of knowledge, the growing complexity of society, the increase of the factors with which we have to deal, the new problems involved in the tendency to build ever larger and more complex buildings, to bring groups of buildings, and even whole towns, within the scope of a single architectural synthesis; when we realize, in short, that architecture is an art that is only in its infancy, we may be willing to admit that co-operation is not only desirable but necessary—if only by way of division of labor.

The practical advantages of division of labor are obvious. Considerable progress has been made, particularly in America, by the association—in partnership or otherwise—of men of different aptitudes, each of whom specializes on his own branch of the problem, but I am more interested for the moment in those who combine to study every aspect of the problem together, and to produce a joint solution. When two or three are gathered together, sharing the same mental outlook or attitude towards their art, and work together to the same ends, they mutually strengthen, stimulate and inspire one another, and personalities seem to mingle, melt and fuse into a something greater than any one of them, a collective personality—the personality of the group. This joint personality appears able to produce a complete mental concept—a joint solution of the problem which is not that of any one member of the group, which is different from that which any one member would have produced alone, and which, in my view, may be, should be, and generally is, better than that which any one member could have produced alone. A design embodying such a concept seems to reflect the collective personality of the group, not the individuality of any one person, and to be governed by a dominating idea, not by a dominant mind.

This suggestion of a collective personality may appear fantastic and quite unnecessary to those who hold that a design must be the outcome of a single mind. They may prefer to take the view that any such group of men is sure to be dominated by one individual, the real creator of the design, to whom the others are really assistants; and that any improvement in the quality of the design would be due to their influence, which seems to point to the value of assistance, provided it is co-operative.

We never seem to have considered how far our work may be simplified and its quality improved by sympathetic and intelligent co-operative assistance. We do not know how to use our assistants. If we do not exploit them we still continue to regard them too much as draughtsmen, or even as clerks, and too little as assistant designers. Instead of taking them into our confidence, opening our minds to them and discussing the problem with them as man to man—recognizing that our greater experience may be our only claim to lead—instead of using them to help us to analyze the programme, study the various factors of the problem, examine the potentialities of various possible solutions, and generally assist us in clarifying and arranging our ideas and arriving at our general concept of the scheme, we bring them in as draughtsmen when the general outline of the scheme is completed and the chance for co-operative assistance is passed. I wonder if we quite realize how much we lose by this procedure, and how much the younger generation loses. The study of completed results may be advantageous to the student, but it is not the same thing as watching and taking part in the mental processes whereby they are obtained. The assistant, either as ghost or draughtsman, must disappear, and be replaced by the assistant architect, trained in the schools to co-operate, if we are to pass on our knowledge, build up a tradition of method, and arrive at that general mental outlook in common so necessary to the advancement of architecture.

Possibly this brings us to the real reason why we do not co-operate more often. Not because we will not, but because we cannot, because we have no traditional method of working and no mental outlook common to us all. We cannot walk together cheering and sustaining one another by the way, because we walk in different ways. Small groups, perhaps, go the same way—possibly arm in arm, co-operating as they go, but these groups have not yet agreed on any one way in which they can all walk together. This way must be found, even if we all have to modify our views, and trust less to our own unaided sense of direction in order to find it; for it is the way of progress by co-operation in design.


TRUSTS AND GUARANTEE CO.

TRUST AND GUARANTEE BUILDING, TORONTO. WM. F. SPARLING, ARCHITECT.

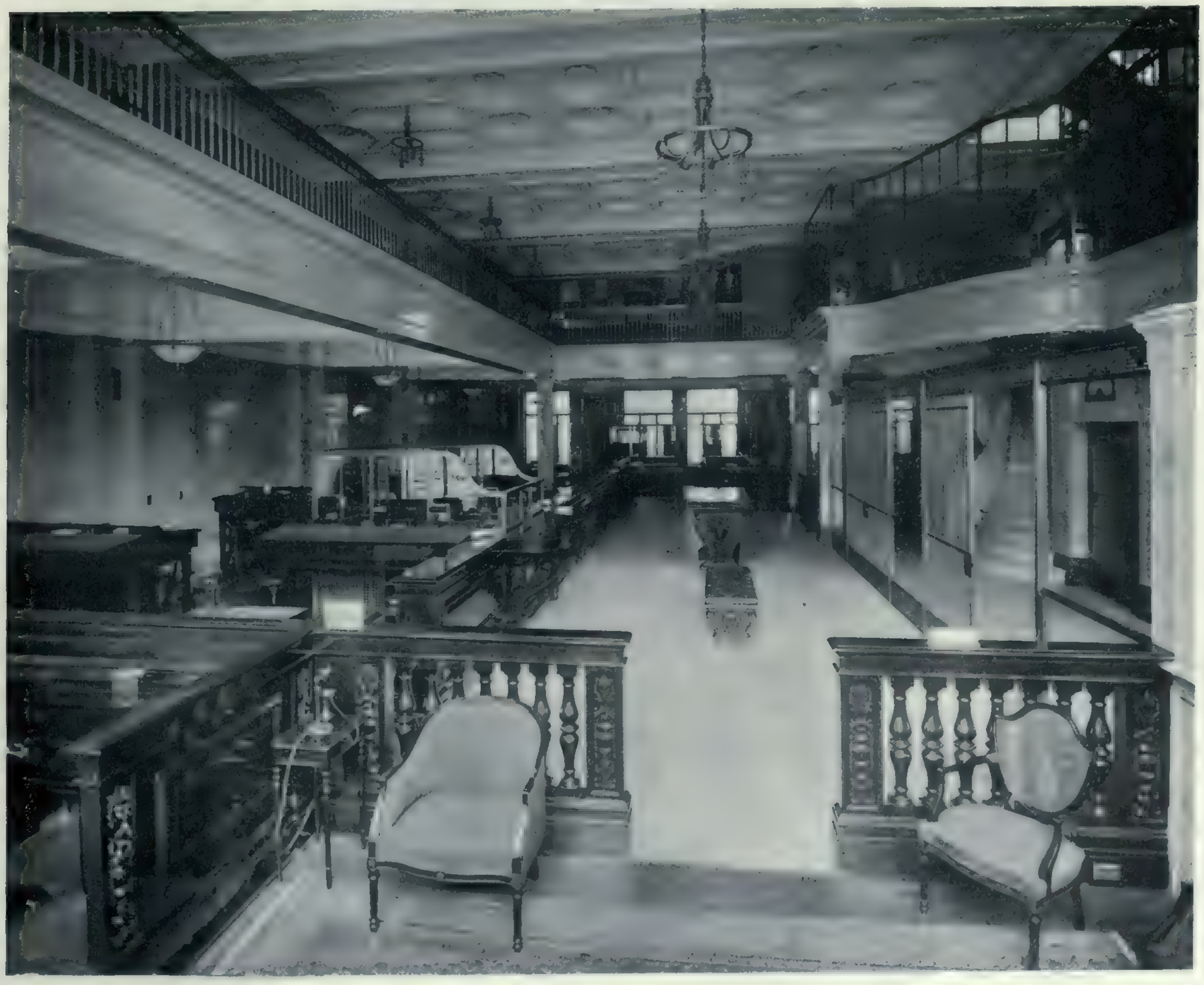
New Trust and Guarantee Building, Toronto

As the centre of Toronto's financial district, Bay street occupies the same relative position that Wall street does to New York, and Lombard street to London, England, only, perhaps, on a slightly more varied scale. It boasts of several of the principal banks, the Toronto Stock Exchange, the National Club, several trust and mortgage companies, the head offices of two large insurance companies, and various brokers' offices, in addition to the City Hall, which forms the terminus at the head of its somewhat short thoroughfare.

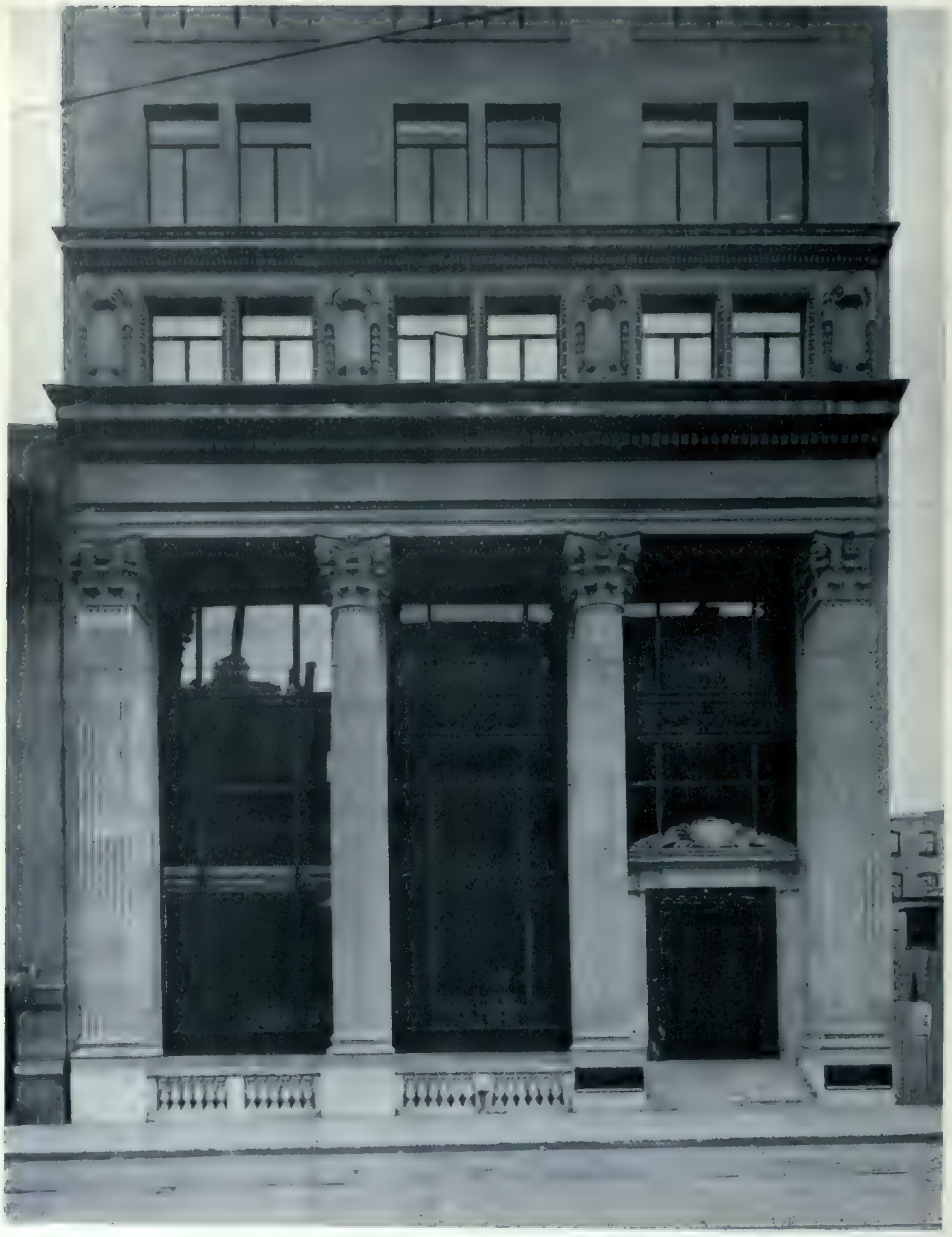
To these has recently been added the new Trust and Guarantee Building, which is entirely in accord with the better class of financial houses on this street, as well as a forerunner of other contemplated buildings of importance which are still to be brought to a point of development. While only seven of the twelve stories provided in the plan have been erected up to the present time, the monumental entrance and architectural treatment indicates the general effect of the design as it will appear when the building is entirely completed. The extra stories will not likely be added until after the war.

The present structure, aside from providing the owner with spacious and modernly appointed quarters, also allows for a source of revenue from the rental of offices on the five upper floors. The construction throughout subscribes to the most approved fireproof methods. Not only is the framework and floor system built of reinforced concrete, but additional precaution has been taken to eliminate from the concrete all limestone and other aggregates which are known to disintegrate under the action of great heat and water.

A special feature of the structural work is the five large reinforced concrete girders which will support the entire upper ten floors. These girders have a 50 ft. span and a depth of 14 ft. 6 in., and their use which give a clear span of 45 ft. 8 in., has made it possible to keep the main banking room entirely free from columns, thus providing an interior that is lofty and spacious in general appearance, besides giving the maxi-



MAIN BANKING ROOM, TRUST AND GUARANTEE BUILDING, TORONTO. WM. F. SPARLING, ARCHITECT.

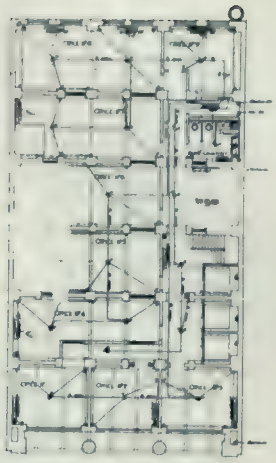


DETAIL OF LOWER FACADE, TRUST AND GUARANTEE BUILDING, TORONTO.

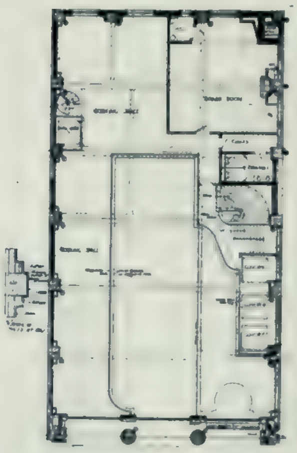
mum of light and working space. This banking room, which occupies the entire width and depth of the building, 50 x 90 ft., is walled and floored in Tavernelle marble, with an enriched plaster ceiling contributing to the general effect. Marble is also used for the elevator enclosures and the monumental spiral staircase leading from the right of the public space to the floors above. All metal work on this floor is done in bronze, and the furniture is of a rich mahogany. The absence of partitions of any kind is an interesting, if not an entirely original feature; resulting in an open banking room scheme, with the elevators and staircase to one side, instead of the usual separate hall entrance which is customary in most plans. Another feature of note is the mezzanine, 12 ft. 6 in. wide, which extends for an unsupported length of 55 ft., being carried by cantilever beams off the outside columns. In addition to providing desk space for a large number of the staff, the mezzanine also gives accommodation to the Board Room, which is decorated and furnished in keeping with the main interior, having a directors' table 8 ft. 6 in. in diameter, made from the architect's design.

The book vaults are situated on the third floor between the heavy reinforced concrete trusses which carry the upper stories; these vaults being accessible only from the main banking room.

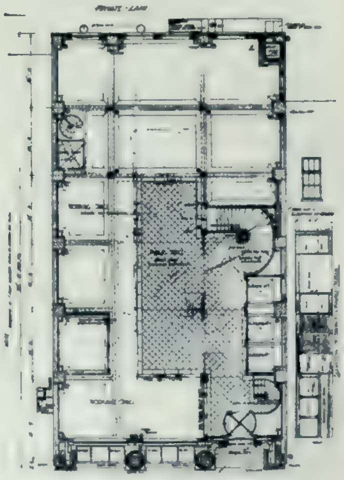
The remaining portion of the building above is entirely laid out in modernly-equipped offices



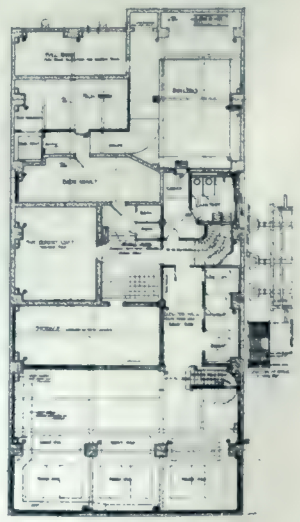
TYPICAL UPPER FLOOR PLAN.



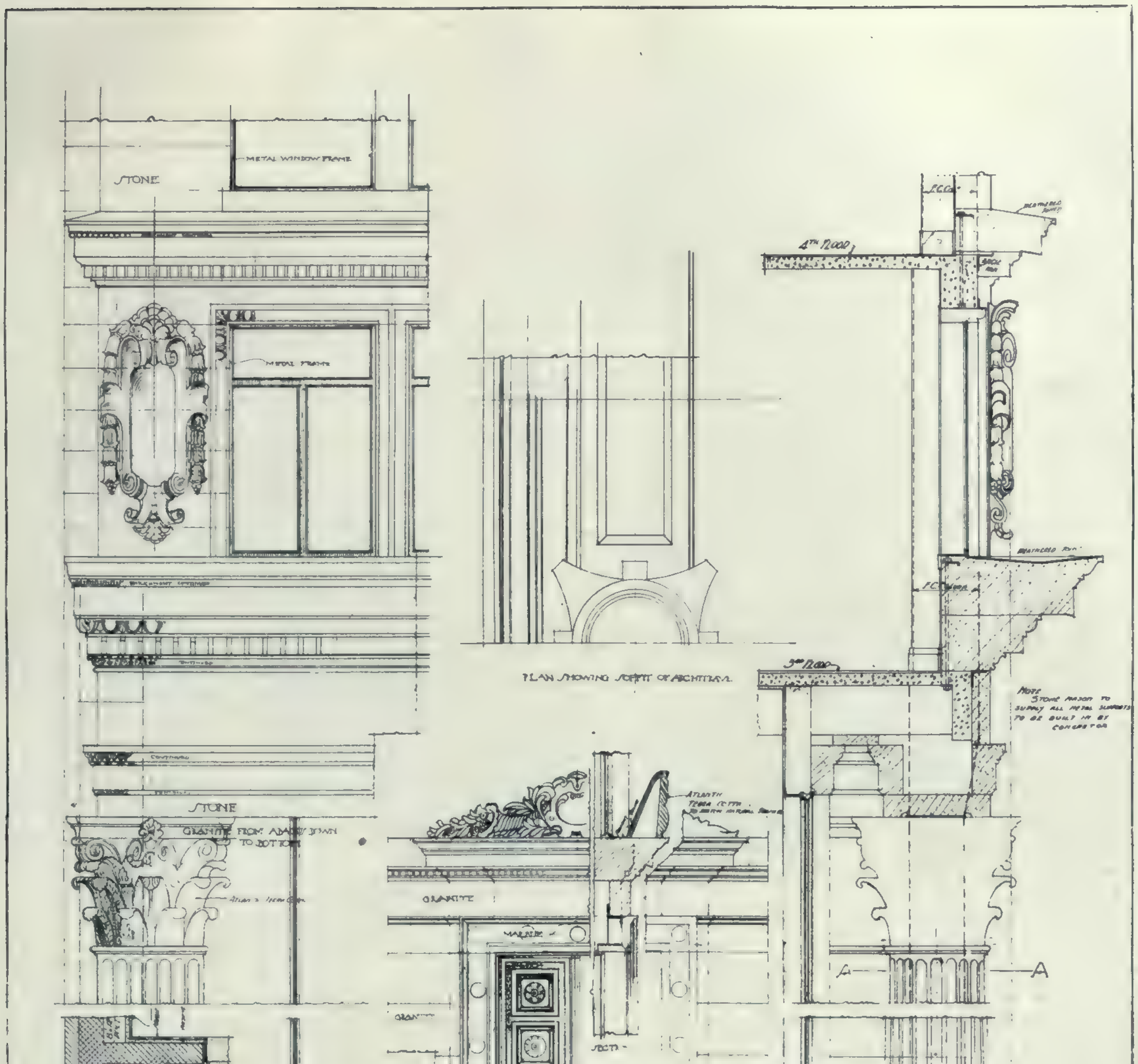
MEZZANINE FLOOR PLAN.



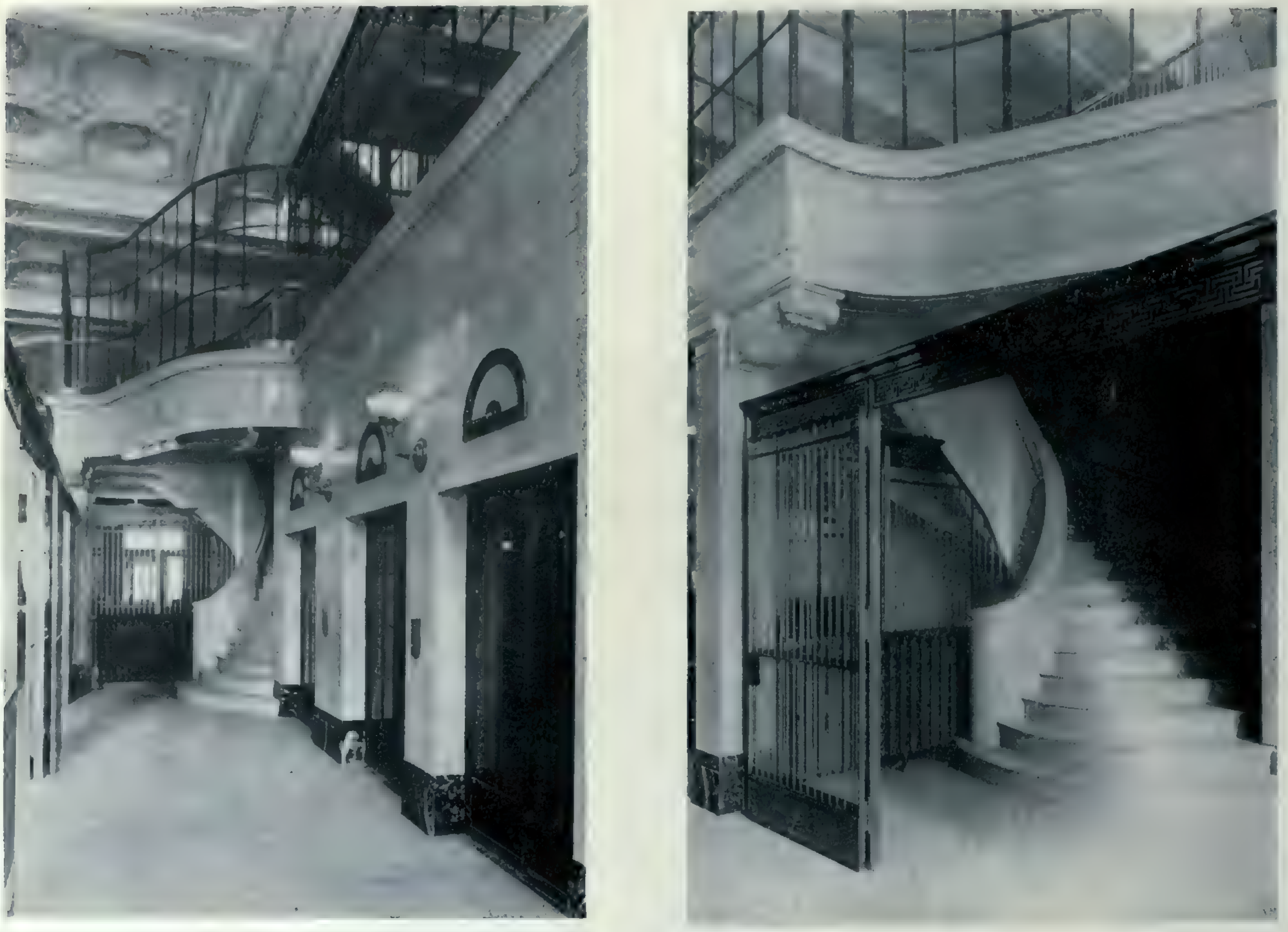
GROUND FLOOR PLAN.



BASEMENT FLOOR PLAN.



TRUST AND GUARANTEE BUILDING, TORONTO. WM. F. SPARLING, ARCHITECT.

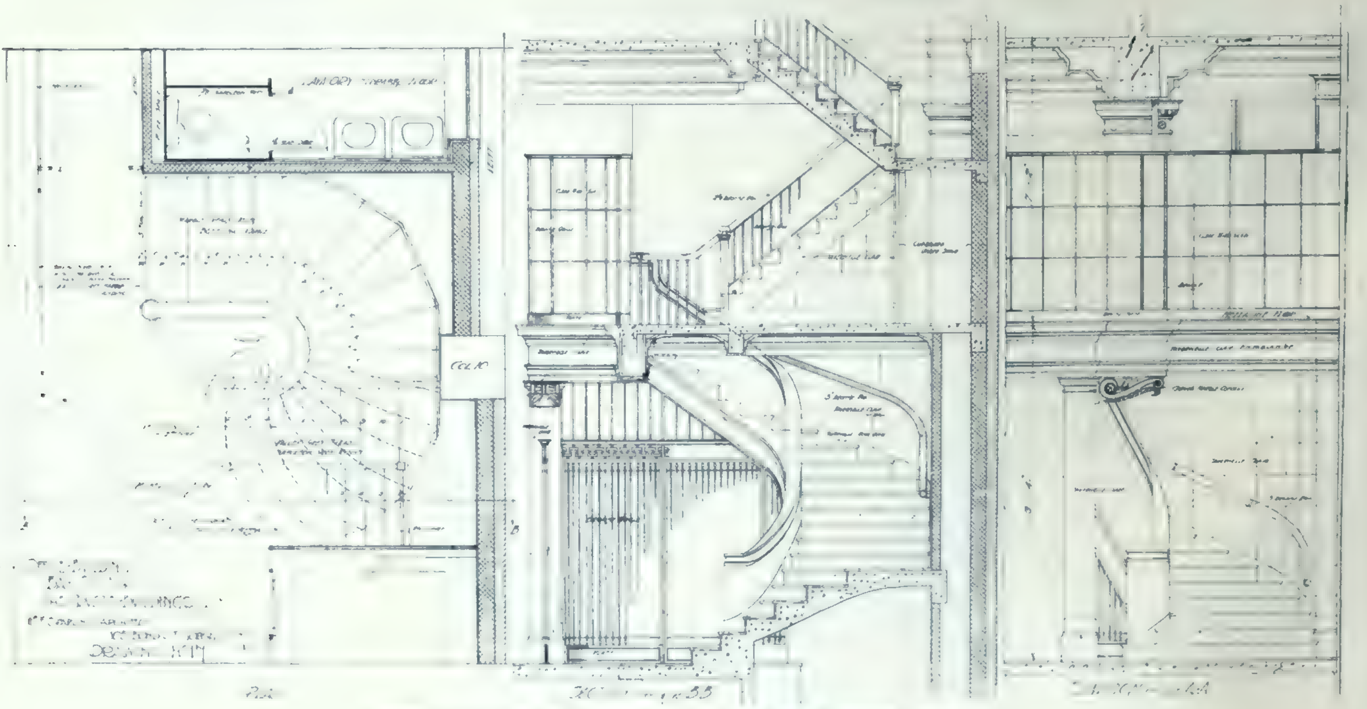


ELEVATOR ENTRANCE AND STAIRS, TRUST AND GUARANTEE BUILDING, TORONTO.

for rent. Three large electric elevators serve the upper floors, while the company's own staff are provided with a special automatic electric elevator to the mezzanine and third floors. Each floor has commodious vaults, lavatories and ample natural light, supplemented by a system of semi-indirect lighting. Cork linoleum is used on all floors throughout.

The front of the building is of Indiana grey stone, the four huge columns forming the entrance resting on a heavy granite support. The side and rear walls are of grey stock brick, backed with hollow tile, while the foundations, which are of concrete, extend down to bed rock 40 ft. below the street level.

In the basement are modern safety deposit



DETAIL OF STAIRCASE, TRUST AND GUARANTEE BUILDING, TORONTO.

CEILING OF MAIN BANKING ROOM, TRUST AND GUARANTEE BUILDING, TORONTO.

vaults, to which access is obtained from the main banking space, as well as from a separate entrance leading from the lower corridor.

The building is equipped with two large down draft smokeless boilers, which serve the steam heating system. The ventilation is along approved lines, the air being taken from the outside of the building at the rear, and washed and heated before being forced through the building.

COLOR HARMONY

The restless modern mind, eager for new fields of conquest, has turned from problems whose solutions were imperative to the conscious search for new problems with which to do battle, eager to try its powers, like the knights of old. Thus the acute problem of the academic decadence brought forth the corrective movement of the Impressionists, who saw that beauty did not lie in the object, but in the perceiving mind, and that thus any object was food for the creative artist. The success of this solution was followed by a conscious attempt on the part of later men to find new problems whose solutions in turn would make them, too, conquerors in art. And so we get the various movements which are

VIEW FROM MEZZANINE, TRUST AND GUARANTEE BUILDING, TORONTO.

known to the average person by the inclusive term of Cubism.

Now, from these various movements there has arisen another: an attempt to correlate design with music, that purest and most abstract of arts, and to thus make it more pure; and we get the movement which has formed an analogy between colors and sounds, so that we now have color harmonics based upon those of music. The spectrum is made to correspond with three octaves of music, divided into thirty-seven shades, each of which corresponds to a half tone on an instrument, and by arranging these shades to correspond with chords in music, they get harmonies of color instead of sounds. They say also that these color combinations really are harmonious when tried, and, based on this analogy, they hope to open vast fields of unexplored aesthetic territory and to produce a new and more abstract art.

LADIES' ROOM, TRUST AND GUARANTEE BUILDING, TORONTO.

There are, however, certain objections to this theory, arising from the physical and philosophic nature of the problem. In the first place, the whole gamut of colors forms only a portion of one real color octave instead of three, and any analogy by octaves is thus purely arbitrary.

But the great fallacy in this theory lies not in the nature of color design, but in the nature of a chord of music. Years ago there were certain combinations of notes that were called (and still are called) harmonies, and others that were called discords. Then, little by little, more of these so-called discords were introduced into music, until now there is probably no combination of notes that has not been used effectively by some great modern master of the art.

Where the whole of music is possible beauty it is nonsense to say that only combinations of color based on the socalled harmonies shall be beautiful, and all else ugly, for that is what music-color harmony amounts to. To the great master, all is harmony in music, though some combinations are easier to understand than others, and so these new-found color harmonies must be, after all, only accidental, and this new field of exploration shrinks to nothing.

After all, taken from the physical point of view, the difference between these different chords is simply due to the degree of complexity

DETAIL OF COUNTER, MAIN BANKING ROOM, TRUST AND GUARANTEE BUILDING, TORONTO.

BOARD ROOM, TRUST AND GUARANTEE BUILDING, TORONTO.

this gives us the only possible case of positive ugliness.

There is a peculiar fact about colors that seems to have been discovered by the exponents of the more modern movements, namely: that certain colors take a certain apparent distance from the eye, regardless of their actual placements, so that to get a perfect appearance of spatial integrity, the colors must be very carefully related, often in contradiction to the actual colors in nature, for space is a greater factor than color, and we cannot always get both. This phenomenon seems due partly to the association of certain colors with certain distances, and partly to subtle relations between the colors themselves. But most of all it is dependent upon the pigments used in painting, for these assume distances of their own, entirely regardless of what their color may be. Lead white will stand off the canvas, while zinc white will recede, but both are white. And it is in this way that the Post-Impressionists have achieved their wonderful feeling for spatial values.

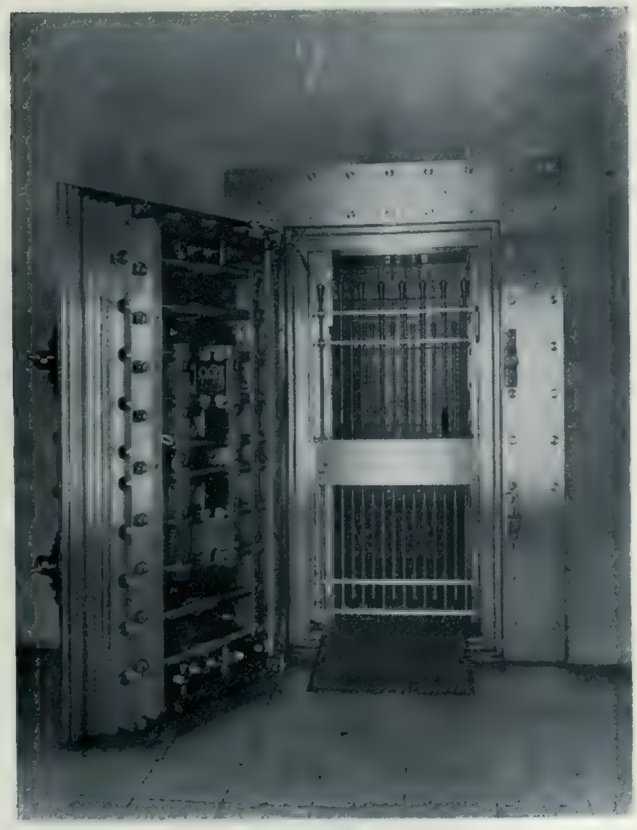
Color harmony is dependent on this placement of colors, for when all the colors in a picture are so organized as to give us a feeling for logical space relations entirely apart from their positions on objects which would otherwise determine them spatially, we get a wonderful sense of harmony. We see the space as shown graphically. We also perceive the space directly from the colors, and this logical co-ordination of what we see with what we know gives us truth and beauty.

But when some object is out of "tone" and stands apparently free from all that to which it should hold fast, we feel the lack of logic and it gives us discord.

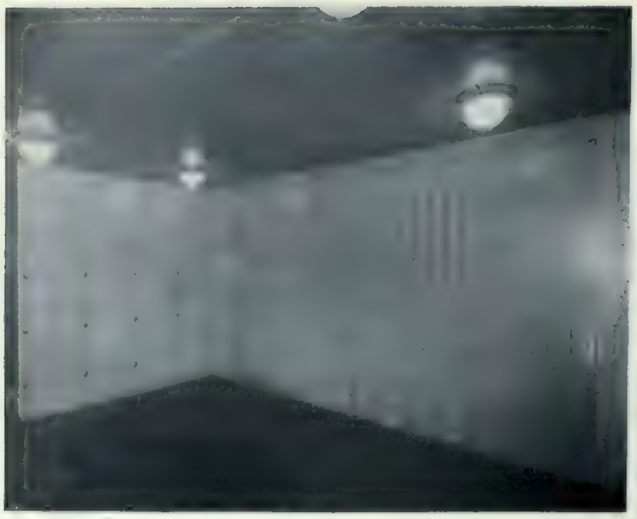
Ordinary wall paper will perhaps give us the best example of this. We know, of course, that it is on a flat surface from the very nature of it, but by actual appearance the figures stand out from the background, giving us two planes where we know there is one. We expect one plane; there appears to be two planes, and because our expectations are aroused and not satisfied, we get positive ugliness.

Color harmony comes, then, when the colors are so related that the direct spatial color perception agrees with the actual or portrayed

of the sound wave-front produced. When the wave-front is simple we get harmony, easy beauty. When it is complex we should expect more difficulty of appreciation, and we do, in fact, get so-called discord or difficult beauty. But with colors the case is totally different, for here we get the beauty of harmony and also real ugliness of discord, for here in certain cases expectations are aroused and are not fulfilled, and



VAULT, TRUST AND GUARANTEE BUILDING, TORONTO.



SAFETY DEPOSIT BOXES, TRUST AND GUARANTEE BUILDING, TORONTO.

space relations. We get discord when the spatial logic is violated. And by varying the pigments to vary the apparent distance of the colors, probably any color scheme could be made either harmonious or discordant, and a color chord could easily be changed into a discord.

But is there not still a ray of hope for color music? Can we not try some other analogy that may bring us nearer the mark? Surely there must be some way out of this quandary, and perhaps a little deeper inquiry into the nature of music may give us a fresh start.

Whatever the notes employed, the time element in music is paramount. Destroy the rhythm and you get chaos. And so we should employ the time element in our color music to get a true analogy. That this is really within the range of possibility is easily seen, for we have all, as children, been fascinated by the toy kaleidoscope, in which we have watched form merging into form, color into color; where patches appeared, spread, and broke into a living design in which a myriad of moving forms played and danced in precise regularity before our eyes. What could be more delightful to watch!

SAFETY DEPOSIT VAULTS, TRUST AND GUARANTEE BUILDING, TORONTO.

Now, what the eye can see can be projected upon a screen, and so the way is clear to develop this changing and interweaving of shape and colors into some tangible system of themes and airs, on which in turn the various forms of music could be built, giving us in color instead of sound the counterparts of the song, rondo, fugue and sonata; actual color music. And this is not so impossible, for a passage once introduced could be contrasted with another to imitate the rondo, one movement could be made to chase another as in the fugue, and we have endless possibilities here before us. It will take much labor and time to develop the keyboard for this new music, but, once established, there is no limit before it. The actual emotional effect of a color or sound, quite contrary to the general conceptions, is of no consequence to art. If the purpose of art is to arouse emotions it must take forever an inferior place, for an emotion is always a reaction, a mechanical product. And though it may be the accompaniment of an action it is in itself inferior to the thing which brought it forth. It is the action, the conscious doing that counts in life, not the emotional reactions that follow and are beyond our control.—*Edwin S. Parker.*

FILING SYSTEM, TRUST AND GUARANTEE BUILDING, TORONTO.

CONSTRUCTION

A · JOURNAL · FOR · THE ARCHITECTURAL
ENGINEERING · AND · CONTRACTING
INTERESTS · OF · CANADA

Αρχιτεκτονία

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The Halifax Disaster

The disaster at Halifax caused by the explosion of the munition ship Mont Blanc, is one of those overwhelming calamities which fate now and again deals from an entirely unexpected source. Its totally destructive character, involving an enormous death toll and great loss of property, has both shocked the entire continent and quickened a sympathetic response from all of Canada and the Eastern States in hastening to the assistance of the afflicted population. Supplies of food and clothing are already pouring into the stricken city in generous quantities from every quarter, but more than food and clothing will be required to approach anything which will give even a fair measure of relief. One of the most urgent needs will be for materials and building equipment to provide shelter for the homeless thousands, and for re-establishing the devastated area of the business and manufacturing section. Already the authorities with commendable enterprise have entered upon the task of organizing towards this end, and the tremendous work before them is best realized when one considers the estimate given in the press of the destruction of twenty-five thousand homes alone. This does not take into account the many large industrial plants, such as the Arcadia Sugar Refinery, the Hollis Foundry, and other large enterprises, including commercial and public buildings, which have been wrecked and damaged. The loss on schools, churches, etc., is likewise heavy. A message sent out by the Catholic diocese and which affects one denomination alone, reads as follows: "Terrible loss, church, rectory, hall, schools, absolutely demolished. Not one family intact in parish."

All this points to the great suffering and destitute circumstances to which Halifax has been reduced, and how necessary and urgent it is for every section of the Dominion to lend a helping hand. Much of the rebuilding of the city will have to be done quickly, and may, perhaps, to an extent be of a temporary character, although it is definitely announced that the authorities have in mind a plan of reconstruction which will give a great improvement over the physical aspect of things as they existed heretofore. A report, in fact, has already been submitted by Thomas Adams, town planning expert of the Conservation Commission, and the Board of Control has decided to request Premier Murray to call a conference of the City Council, the Board of Trade, the Provincial Government, the Federal Government, the Executive of the Relief Committee, the Town Planning Board, and the Naval and Military authorities, with a view to having a permanent Commission appointed to deal with the problems now confronting the city.

In the meantime the building fraternity can possibly do a great deal by co-operating fully with the authorities in fulfilling every demand for materials and supplies, and by giving every assistance required. That there will be some very interesting data gathered as to the effect of the explosion on certain structural elements is altogether probable, and together with observations of sanitary and other conditions, will eventually give architects and engineers much information of value and assistance.

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Saskatchewan Association Elects Officers

The following officers were elected for the ensuing year at the annual meeting of the Saskatchewan Association of Architects, held recently at Regina: President, R. G. Bunyard, Moose Jaw; vice-presidents, J. H. Puntin, Regina, and N. L. Thompson, Saskatoon; secretary-treasurer, Francis B. Reilly, Regina; members of council, Professor Greig, Saskatoon; A. J. Creighton, Prince Albert, and W. G. Van Egmond, Regina.

The business of the meeting was chiefly routine. Mr. Reilly, the secretary, reports that the war has curtailed building operations in the province, but that general business conditions are improving and will tend to stimulate activities in this line. The membership roll of the association includes a list of fifty enlistments.

Canadian Building and Construction News

BUSINESS BUILDINGS.

Toronto, Ont.—Plans have been completed for store alterations at 87 Yonge street, for the Sparrow Estate, 199 Church street. J. Francis Brown, Board of Trade Building, architect.

Toronto, Ont.—Work is in progress in repairing fire damage to the drug store of Liggett Company, 106 Yonge street, which entailed a loss estimated at from $15,000 to $25,000 on building and fixtures.

Toronto, Ont.—Architect, P. H. Finney, 79 Adelaide street East, has completed plans for a public garage and repair shop to be erected on Broadview avenue, for M. J. Mitchell, 9 First avenue. The building will be of brick construction and cost $10,000.

Toronto, Ont.—General interior alterations are being made to the branch of the Bank of Hamilton, at the corner of Yonge and Gould streets. Work is being done by day labor and will cost $4,000. Wm. F. Sparling Company, 120 Bay street, are the architects.

Watford, Ont.—Tenders have been received for a two-storey brick building, 30 x 40, to be erected here for the Merchants Bank of Canada. Sheppard & Calvin, Excelsior Life Building, Toronto, are the architects.

CHURCHES AND SCHOOLS.

Belleville, Ont.—The city has authorized the purchase of land as a site for rebuilding Albert College. The sum of $20,000 or more will be expended on the building. Work may not start until after the war.

Cobourg, Ont.—Plans have been completed for rebuilding school at this place recently destroyed by fire. Chapman & McGiffin, 95 King street east, Toronto, are the architects; the principal trades will be done by local contractors. Cost $60,000.

Hamilton, Ont.—Work is in progress on a hall of frame construction for the Roumanian Greek Church. Milburn & Armes, 385 Bold street, are the contractors. Cost $3,000.

Hamilton, Ont.—The following contracts have been awarded for the erection of a Parish Hall of brick construction, at the corner of Grey and St. Joseph streets, for the Polish Church. General contractor, J. J. Giles, 451 Aberdeen avenue; mason, W. Inrig, 140 Flat avenue; concrete work, Lewis & Midgley, 25 Lotteridge street.

Mount Dennis, Ont.—Plans have been completed for a six-roomed brick school addition to be built for School Section No. 28, Mount Dennis. Ellis & Ellis, Manning Chambers, Toronto, are the architects.

New Richmond, Que.—Architect, P. Levesque, 115 St. John street, Quebec City, is preparing plans for a presbytery to be erected for Rev. C. Michaud, New Richmond. Cost $8,000.

Toronto, Ont.—Tenders have been received for a twelve-roomed school annex to be built in connection with Queen Alexandra School. Cost $60,000.

Toronto, Ont.—The Board of Education; 155 College street, has received tenders for the erection of a nine-roomed addition to Perth Avenue School. Cost $60,000.

Toronto, Ont.—The Holy Rosary Parish has requested the Separate School Board to erect a new school at the corner of St. Clair and Kendall avenues. Estimated cost $8,000.

CLUBS AND HOSPITALS.

Chatham, Ont.—Robt. Gray, a prominent citizen of Chatham, has purchased the Algonquin Hotel and will entirely renovate and equip same for Y. M. C. A. purposes.

Ottawa, Ont.—A by-law authorizing $40,000 for the erection of a club building for the Great War Veterans' Association, will shortly be submitted to the ratepayers.

London, Ont.—Tenders will shortly be called for the new Military Hospital to be erected on the O'Dell property, Westminster Township, to cost $150,000. The buildings will be of white brick construction and modern in their equipment throughout.

Toronto, Ont.—Alterations for club purposes are being made to the residence at the corner of Burnaby street and Oriole road, which will be occupied by the Pine Grove Hunting and Riding Club. The work will cost between $3,000 and $4,000.

Toronto, Ont.—The proposed soldiers' hospital to be built in High Park for the Military Hospitals Commission, will comprise four or five buildings connecting with an administrative building, and give accommodation for one thousand beds. Estimated cost $300,000. It is understood that plans have been completed.

CIVIL ENGINEERING.

The Hydro Electric Commission has decided to proceed at once with improvements to obtain an additional 25,000 H. P The extensions will be made in connection with the Ontario Power Company's plant controlled by the Commission.

Omemee, Ont.—The ratepayers will vote on a by-law at the January election to raise $9,000 for the erection of a hydro electric power house.

PLANTS, FACTORIES AND WAREHOUSES.

Beamsville, Ont.—Work is in progress in clearing site for the new aviation buildings to be built here for the Royal Flying Corps. It is understood that the erection of structures will be started very shortly.

Brantford, Ont.—Tenders have been received for alterations and additions to the factory of the Steel Company of Canada, located on Oxford street. W. C. Tilly, Temple Building, is the architect.

Galt, Ont.—The following contracts have been awarded for the erection of a one-storey brick and steel addition, 180 x 140, to the factory of the Canadian Machinery Corporation. General contractor, P. H. Secord & Son, Brantford, Ontario; steel work Hamilton Bridge Works, Hamilton, Ontario. Cost $30,000.

Hamilton, Ont.—Work is in progress on a factory and office building of brick construction for the Canadian Shovel & Tool Company, Imperial street. Geo. E. Mills, 614 King street, is the contractor.

Owen Sound, Ont.—A site has been selected for the proposed $75,000 factory to be built for the Steel Screw Company. Work will start as soon as final arrangements are completed. J. H. Cole is one of the interested parties.

Port Arthur, Ont.—It is the intention of the Canadian Northern Railway to rebuild elevator "B" during the coming months. Cost $500,000.

Port Arthur, Ont.—Tenders have closed for a grain elevator of reinforced concrete construction to be built for the Saskatchewan Co-Operative Elevator Company, Grain Exchange Building, Winnipeg. C. O. Howe & Company, Port Arthur, are the engineers. Cost $450,000.

Toronto, Ont.—S. F. Bowser & Company, 66 Fraser avenue, is erecting a factory addition to cost $5,000.

Toronto, Ont.—The Dunlop Tire & Rubber Company, 244 Booth avenue, are erecting a brick addition to their power house. Cost $5,500.

Toronto, Ont.—The Cluff Ammunition Company, 27 Atlantic avenue, are rebuilding their plant recently destroyed by fire Cost $20,000.

Toronto, Ont.—The Canadian Aeroplanes are erecting an additional storey to their building at Dufferin street and Lappin avenue. Cost $27,000.

Toronto, Ont.—The Bond Engineering Works, foot Cherry street, have taken out a permit for the erection of an addition to foundry on Villier street, to cost $8,000.

Toronto, Ont.—Plans have been completed for alterations to the warehouse of M. Rawlinson Ltd., 610 Yonge street. Wickson and Gregg, Kent Building, are the architects.

Toronto, Ont.—Hepburn & Disher, 18 Van Horne street, are building a storage of steel and galvanized iron construction for the Canada Metal Company, Fraser avenue. Cost $6,000.

Toronto, Ont.—Architect B. Swartz, 30 Centre avenue, has completed plans for a brick warehouse to be built on Wolseley street, for Brenzel & Weintroub, 145 Elizabeth street. Cost $10,000.

Toronto, Ont.—Plans have been completed for a building of brick construction to be built on Tuttal place, near Elizabeth street, for the New System Laundry. B. Swartz, 30 Centre avenue, is the architect. Cost $3,000.

Toronto, Ont.—A lease on a fifteen-acre site in the vicinity of Spadina avenue and Queen's wharf has been ratified by the Harbor Commission for the proposed plant of the Dominion Shipbuilding Limited. It is understood that work is to be started at once.

Toronto, Ont.—An additional floor is being built to the cooler building of the Swift Canadian Company, St. Clair avenue, at a cost of $20,000. Concrete, brick and steel are the materials being used. Archibald & Holmes, Excelsior Life Building, are the contractors.

Toronto, Ont.—Construction is being carried out on a brick addition to the concentrator building and laboratories of the British Acetones Limited, 2 Trinity street. James A. Wickett Ltd., Bank of Hamilton Building, has the general contract and the Dominion Bridge Company the contract for steel roof.

Toronto, Ont.—Architects Sproatt & Rolph, 36 North street, have awarded the following contracts for a stable and delivery warehouse to be built for the T. Eaton Company, 190 Yonge street. Mason, Thompson Bros., Ryrie Building; steel work McGregor & McIntyre, 1129 Shaw street. The structure will be of brick, steel and concrete and cost $65,000. It will be located on Coxwell avenue, north of G. T. R. tracks.

Wallaceburg, Ont.—The Dominion Sugar Company intends to immediately rebuild their warehouse and drying factory recently destroyed by fire at a loss of $100,000.

Weston, Ont.—Work is in progress on a one-storey brick factory, 70 x 150, for the K. & S. Canadian Tires Limited, 527 Yonge street, Toronto. The work is being done under the supervision of Wm. F. Sparling Company, architects, 120 Bay street. Toronto. Two additional storeys are to be built at a future date.

MISCELLANEOUS.

Coniston, Ont.—Work is in progress on a dry house to cost $30,000, for the Mond Nickel Company Limited, Coniston. The construction will be of brick and steel and the equipment will include shower baths, tile walls, etc.

Guelph, Ont.—The following contracts have been awarded in connection with a one-storey building of fireproof construction to be erected on Wyndham street, for the Guelph & Ontario Savings: General contractor, Johnston & Williams, Woolwich street; concrete and plastering, J. J. Mahoney, Kent street; carpenter, Victor Sheppard, 72 Oxford street; painting and glazing, W. Cook, Quebec street; roofing, Frank & Schultt, 92 McDonnell street; electric wiring, Stephenson & Malcolm, Quebec street; heating and plumbing, Mahoney Bros., Quebec street. Cost of building $7,000. W. A. Mahoney, Woolwich street, is the architect.

Toronto, Ont.—Work has started on alterations to stable and garage of J. H. Doane, 621 Yonge street. Cost $7,000.

Toronto, Ont.—The Board of Control has authorized Works Commissioner Harris to invite tenders for installing air chambers at the new pumping station. Cost $50,000.

Toronto, Ont.—Geo. M. Garton, 120 Victoria street, has plans completed for a brick apartment house to be built on Bloor street, near Glendowynne avenue. Cost $15,000.

Toronto, Ont.—Work has started towards repairing fire damage to offices in Aberdeen Chambers, recently damaged by fire. The building is owned by T. W. Hollwey, 41 Victoria street, and the work will cost $20,000. Wickson & Gregg, Kent Building, are the architects.

Toronto, Ont.—Tenders will be received by the Board of Control until January 15th, 1917, for the construction of drainage system (wrought iron pipes) for Don Bridge, Bloor street Viaduct. Specifications may be obtained at the Bloor street Viaduct, Field Office, 89 Castle Frank crescent.

Toronto, Ont.—Plans have been completed for brick stores and apartments to be built on St. Clair avenue near St. Clair gardens, for Calderone Bros., 1248 St. Clair avenue. Owner has not decided whether to proceed with work now or wait until spring. Geo. N. Williams, 415 Keele street, is the architect. Cost $18,000.

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RESIDENCES.

Brantford, Ont.—Architect Frank Nicolls, Temple Building, has completed plans for a residence of stucco and tile construction to be built on Echo place, for Fred Webster, 80 Erie avenue. Cost $10,000.

Dundas, Ont.—P. H. Secord & Sons, Brantford, Ontario, have been awarded the general contract for rebuilding the residence of Col. Gwynne, of this place, which was recently destroyed by fire. The reconstruction of the building will cost approximately $14,000.

Hamilton, Ont.—G. E. Gaylord, 54 Lamoreaux street, is erecting two brick residences on Province street, to cost $5,000.

Hamilton, Ont.—R. Tope & Sons, 191 Robinson street, have the general contract for the erection of a three-storey brick residence for J. G. Milne, 32 Mountain avenue.

Hamilton, Ont.—Work is in progress on a $6,000 brick residence on Fairleigh crescent, for Mr. Kent, Main street East. J. Bryers, 36 Gibson avenue, has the general contract.

Hamilton, Ont.—The Frid Construction Company, Sun Life Building, have the general contract for $30,000 brick apartment house, to be built on King street, for W. T. Dyment. F. W. Warren, Bank of Hamilton Building, is the architect.

Hamilton, Ont.—Work has started on two brick residences to be built on Stirton street, for W. R. Bennett, Victoria Apartments. Mason, J. Tope, 191 Robinson street; plastering, W. Bayliss, 372 Beach road; painting and glazing, Mr. Haywood, 178 Stirton street; electric wiring, L. H. Landers, 15 King street East; heating, H. Day, 34 Huron street. Cost $5,000.

London, Ont.—John Putherbough, 1006 Wellington street, is erecting a brick residence to cost $4,000. Hyatt Bros., 288 Egerton street, have started work on several brick residences to cost from $2,000 to $4,000. It is also their intention to build several new houses in London East.

Oakville, Ont.—Alfred Raynor, 244 Broadway avenue, Toronto, has the general contract for the construction of a chaffeur's cottage at this place, for Col. Henry Brock. Denison & Stephenson, 28 King street West, are the architects. Cost $8,000.

Ottawa, Ont.—W. E. McCarthy has been awarded the contract for the erection of a three-storey brick apartment house to be built on Lewis street, for Alex Young, McKellar Townsite. Cost $22,000. Owner can be addressed at Westboro, Ontario.

Renfrew, Ont.—M. J. O'Brien has the general contract for a residence to be built on Lyn street, for Guy M. French. It will be of brick veneer construction, modernly equipped, and cost $10,000.

Toronto, Ont.—G. F. Cudmore, 62 Pacific avenue, is erecting two houses on Runnymede road, to cost $6,000.

Toronto, Ont.—An apartment house to cost $40,000, is being built on Heath and Kendall avenues, for J. M. Walker, 528 Palmerston boulevard. It will be four storeys high and of brick construction, modernly equipped throughout. Owner supervises work.

Toronto, Ont.—McGriffin Contracting Company, 7 McRoberts avenue, is building a duplex residence of brick construction to cost $2,500. Work has also started on three residences to cost $4,000 each, on Dufferin street, for Brook Sykes, 1796 Dufferin street.

Toronto, Ont.—Plans have been completed for a brick residence to be built on Runnymede road, for J. Carroll, 10 Kennedy avenue. Cost $4,000. Also for a residence to be built at the corner of Palmerston gardens and boulevard, for W. J. Brown, 487½ Concord avenue. Cost $3,000.

Toronto, Ont.—Architect W. G. Hunt, Confederation Life Building, has awarded the contract for the erection of a $3,500 brick residence for Mrs. Gates to W. J. Sanderson, 270 Spears avenue. Work is also in progress on a brick residence, being built on Kennedy avenue for S. B. Green, 40 Woodside avenue. Cost $3,000. Also a brick residence, to be built by the same owner on Lauder avenue near Regal road. Cost $3,000.

Toronto, Ont.—Plans have been completed for a residence to be erected on Poplar Plains road, for Wm. J. Robertson, 63 Lynwood avenue. Cost $6,000. James Mitchell, 55 Isabella street, is the architect. Plans have also been completed for a brick residence to be built on Greenwood avenue, for J. E. Carlisle, 25 Woodside avenue. Cost $3,500. Also for two brick residences to be built on Dufferin street, for F. H. Miller, 307 Lauder avenue. Cost $6,000. Also for a duplex residence to be built for Miss Ella Ball, 33 Stacey street. Cost $4,000.

Toronto, Ont.—Plans have been completed for a residence and garage to be built on Oriole road, for F. M. Sloan, 91 Forest Hill road. Brick will be used for the exterior walls and the equipment throughout will be modern. Cost $12,000.

Toronto, Ont.—Warrington & Bage, 82 Wheeler avenue, have started work on the erection of three brick residences, on Drayton avenue near Stacey street. Cost $5,000. Operations have also started on a residence to be built on Beresford avenue, for J. P. Luckhart, High Park Gardens. Cost $3,000.

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CONTRACTORS and SUB-CONTRACTORS

As Supplied by The Architects of Buildings

Featured in This Issue

Knox Presbyterian Church, Winnipeg.

Electric Fixtures, Canadian H. W. Johns-Manville Co.
Electric Contractor, Thomas W. Price.
Paints and Varnishes, R. Crawford.
Plumbing Contractor, John Plaxton Co.
Roofing, A. D. Christie.
Seating, Valley City Seating Co.
General Contractors, James McDiarmid.

First Church of Christ, Scientist, Winnipeg.

Brick (stock), Alsip Brick Co.; D. D. Wood & Sons.
Brick (face), Agents N. J. Dinnen & Co.; Hydraulic Press Brick Co.
Boilers, Spencer Steam Boilers.
Cabinet and Woodwork, Winnipeg Paint & Glass Co.
Carpets and Rugs, The Hudson's Bay Co.
Electric Fixtures, McDonald & Willson, Ltd.
Electric Contractors, Merriott-Denbigh Electric Co.; Levvy Electric Co.
Furniture, The T. Eaton Co.
Glass (ornamental), The Consolidated Plate Glass Co.
Hardware, Marshall-Wells Co.; The J. H. Ashdown Hardware Co.
Paints and Varnishes, G. F. Stephens Co.
Plaster Work (ornamental), W. C. Metge.
Radiators, The Dominion Radiator Co.
Roofing, George A. Boardman.
Stone (Tyndall quarries), Wallace Sandstone Co.
Seating, Globe Furniture Co.
Structural Iron and Steel, Vulcan Iron Works.
General Contractors, Wallace & Akins; Fort Garry Construction Co.

Stanley Presbyterian Church, Montreal.

Brick Contractor, Reid, McGregor & Reid.
Boilers, Dominion Radiator Co.
Carpentry, Cabinet and Woodwork, F. S. Hudson Co.
Concrete Work, Church, Ross & Co.
Electric Fixtures, McDonald & Willson, Ltd.
Electric Contractor, McDonald & Willson, Ltd.
Furniture for Altar, Berlin Interior Hardwood Co.
Marble and Tile, James Walker Hardware Co.
Paint Contractor, R. E. Jones.
Pipe Organ, Casavant Freres.
Plumbing Contractor, John A. Gordon.
Plaster Work, R. G. Hamilton.
Radiators, Dominion Radiator Co.
Roofing Tile, Geo. W. Reed & Co.; Ludiwici Caledon Co.
Seating, Berlin Interior Hardwood Co.
Structural Iron and Steel, Dominion Bridge Co.
Vaults, Ahearn Safe Co.
Ventilating System, Canadian Blower & Forge Co.
Acoustical Engineers, Mazer Acoustile Co.

First Presbyterian Church, Montreal.

Brick Contractor, Reid, McGregor & Reid.
Carpentry, Cabinet and Woodwork, D. M. Long.
Concrete Work, Church, Ross & Co., Ltd.
Electric Fixtures, McDonald & Willson.
Electric Contractor, Collier & Brock.
Glass, Stained, Hobbs Mfg. Co.
Hardware, D. M. Long.
Paint Contractor, W. E. Potter.
Pipe Organ, Casavant Freres.
Plumbing Contractor, Alex MacKay & Co.
Plaster Work, R. G. Hamilton.
Roofing Tile, Richards & Simard.
Stone, P. Lyall & Sons Construction Co.
Seating, Berlin Interior Hardwood.

Howard Park Methodist Church, Toronto.

Boilers, Steel & Radiation, Ltd.
Cabinet and Woodwork, J. R. Eaton & Sons, Ltd.
Concrete Work, Ramsay Concrete Co.
Carpenter and Interior Fittings, W. A. Rumley.
Electric Fixtures, Geo. J. Beattie & Co.
Furniture for Altar, Globe Furniture Co.
Glass, Toronto Plate Glass Co.
Hardware, Sargeant & Co.
Mason Contractor, Wm. Halls.
Paint Contractor, Faircloth & Co.
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Roofing, Geo. Duthie & Sons.
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Seating, Globe Furniture Co.
Structural Iron and Steel, Hepburn & Disher.
Tile, The T. Eaton Co.
Ventilating System, Shantz Ventilating Co.

Trust & Guarantee Building, Toronto.

Brick, Don Valley Brick Works.
Boilers, Kewanee Boiler Company.
Carpets and Rugs, Murray-Kay Company.
Casements and Window Construction, (also Doors and Window Trim), Trussed Concrete Steel Co.
Clocks, International Time Recording Co.
Concrete Work, Mouschil & Partners.
Electric Fixtures, F. C. Henderson.
Electric Wiring and Apparatus, Bennett & Wright.
Elevators and Hoists, Otis-Fensom Elevator Co.
Fire Escapes, Architectural Bronze Co.
Fire Extinguishers, Wilson & Cousins.
Foundations, Wm. Cowlin & Sons.
Floor Covering, Cork Carpet, Murray-Kay Co.
Flooring, Italian Mosaic Co.
Fittings, (Board Room Table) L. Rawlinson Ltd.
Furniture, Canadian Office & School Furniture Co.
Furniture, Office Specialty Co.
Glass (Plate), Hobbs Mfg. Company.
Glass (Wired), Hobbs Mfg. Company.
Grilles, Architectural Iron Bronze Co.
General Contractors, Wm. Cowlin & Sons.
Hardware, Canada Hardware Co
Heat Regulating System, Johnson Temperature Regulating Co.
Hollow Tile, Sun Brick Co.
Interior Fittings, Canadian Office & School Furniture Co.
Marble, Hoidge Marble Works.
Ornamental Iron, Architectural Bronze & Iron Works.
Paint Contractors, W. J. Bolus Co.
Plumbing Contractor, Bennett & Wright.
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Plaster Work, R. C. Dancy.
Radiators, Dominion Radiator Co.
Signs, Day Sign Company.
Stone, Indiana Limestone Co.
Stone Contractor, Scott Bros.
Vaults, J. & J. Taylor Co.
Varnish, Pratt & Lambert.
Ventilating System, Sheldons Limited.

UNDER A NEW NAME.

The Black Building Supply Company, Ltd., 201-2 Mail Building, Toronto, a well-known firm handling building specialties, has changed its name to Drummond & Reeves, Limited. Both Mr. N. W. Drummond and Mr. L. A. Reeves, of the new concern, were connected with the old company. Under the new arrangement the reorganization will carry on the business that has been developed by the Black Building Supply Company during its seven years' existence. It will be the aim of the Drummond & Reeves concern to do everything in its power to give first-class service to its old customers, and at the same time develop a new clientele by handling a wide line of well-known building specialties. Among the building materials which are being handled are: Architectural terra cotta and face bricks, salt-glazed and enameled brick, paving bricks, the Toch Brothers' paints and waterproofing, plasterers' metal corner beads, picture moulds, bases, etc., and patent safety scaffolding machines.

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ARCHITECTURAL FIRM CHANGES NAME.

The business of Bernard H. Prack, up to the present conducted as Prack & Perrine, will hereafter be known as Bernard H. Prack, Industrial Architect and Engineer, with offices as at present, 801-4 Keystone Building, Pittsburgh, Pa., and 808 Lumsden Building, Toronto.

Mr. Prack, whose home for the past seven years has been at Hamilton, specializes in the building of foundries, machine shops, power plants, and also specializes in the equipment, and is making a specialty of producing complete industrial buildings.

A few of the Canadian buildings designed by Mr. Prack are as follows: Office and factory buildings for the Canadian Westinghouse Company, Hamilton; power plant for the Dominion Power and Transmission Co., Hamilton; Oliver Chilled Plow Works, Hamilton; Standard Underground Cable Co., Hamilton; Wm. Wrigley, Jr., Company, factory, Toronto; Canada Cycle and Motor Car Company plant, Weston; Cowan Chocolate Company plant, Toronto; B. J. Johnson Soap Company factory, Toronto, and numerous other large plants throughout the Dominion.

CATALOGUES and BOOKLETS

DISTINCTIVE CHURCH FURNITURE.

The Globe Furniture Company, Limited, Waterloo, Ont., have published a comprehensive book of 68 pages and cover, entitled "Distinctive Church Furniture," copies of which will be sent to any Canadian architect on request.

The book has many interesting illustrations, showing church interiors, plans of altars, sketches of church furniture of all kinds, and detail plans of pulpits, confessionals, vestment cases and wardrobes. Other views show various types of pews, communion rails, sanctuary seats, bishop's chairs, clergy stalls, baptismal fonts, etc., with some illustrations of lodge, office and school furniture.

Some valuable information is given in the reading pages, and architects interested in church work will find the book a valuable addition to their office library.

"ADSCO" SYSTEM OF HEATING.

The "Adsco" system of atmospheric steam heating which is adaptable for all types of public and private buildings is explained in detail in an interesting bulletin published by the American District Steam Company of North Tonawanda, N. Y. The "Adsco" is a vapor system which it is claimed has stood the test of actual operation under all sorts of climatic conditions in almost every type of modern building. The system hinges on the principle that steam is lighter than air. Wherefore steam admitted through a valve into the top of a radiator occupies the upper portion of the radiator, the condensation and air flow out at the bottom. The "Adsco" valve does not permit an excess amount of steam to pass into the radiator; hence no heat is wasted, but the maximum amount of heat is delivered to the room. The company offers its services in a consulting capacity to inquirers who have specific heating problems. These bulletins may be had by architects on request.

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"DEFEND YOUR STEAM."

With the present possibilities of a very serious shortage of coal, and with a warning constantly before us, urging economy in every industrial field, the question of the maximum amount of power from a minimum amount of coal becomes one of considerable importance.

It is these conditions that prompt the Magnesia Association of America, whose offices are in the Bulletin Building, Philadelphia, Pa., to issue a pamphlet entitled "85% Magnesia and Heat-Insulation."

For more than a quarter century carbonate of magnesia, in an approved form, has been recognized as an efficient and economical means of heat-saving. Its uses, as perfected by this association, are very clearly set forth in the pamphlet referred to, and with the great amount of information presented, it will be found a most timely and instructive reference for architects in specification. The pamphlet may be had on application.

◆

HANDBOOK ON VACUUM CLEANERS.

B. F. Sturtevant Company of High Park, Boston, Mass., and with branches at Montreal and Galt, Ont., who for the past half century have been manufacturers of fans for industrial uses, have perfected a vacuum cleaning apparatus which they state has proved eminently successful. The company, recognizing the importance of proper installation of vacuum cleaning systems in buildings, has prepared a handbook for architects and engineers, discussing all points of the plant and its installation. Instructions for computing suction losses and for determining on the sizes of machine, piping and hose lengths required are given, with tables and diagrams for easy reference. A complete standard specification form covers all points of importance to the architect. This booklet is known as Catalogue 248. Another catalogue, No. 244, covers the subject from a more popular standpoint. Both will be of value to architects specifying vacuum cleaners.

CHURCH FURNITURE AND PEWS

Interior of Howard Park Methodist Church, Toronto, as shown in the illustration, equipped throughout by the Globe Furniture Company to the designs of the architect, Mr. W. G. Burns, Toronto.

In the building of Church Furniture, and Pews, Art in Design is as essential as in the planning of the building itself.

We will submit sketches and designs without charge or obligation to any architect on request.

A copy of "Distinctive Church Furniture" will be sent on request.

THE GLOBE FURNITURE CO., LIMITED, WATERLOO, ONTARIO

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